STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

For forty-eight years—IRON TRADE REVIEW

Contents . . . . April 19, 1937

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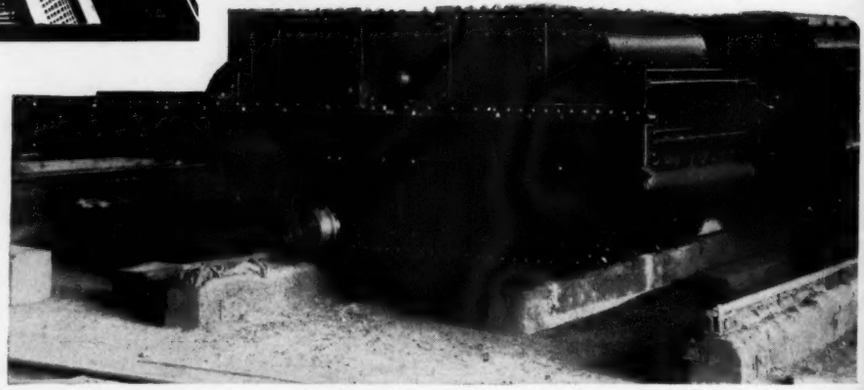

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As the Editor Views the News

INDUSTRY—now immune to hard-knocks by virtue of gruelling experience—accepted the Supreme Court's decision on the Wagner act as part of the routine of a day's work. Many employers feel that the law, one-sided as it is, if enforced, will result in conditions infinitely more tolerable (p. 37) than the state of lawlessness which has prevailed recently in some districts. The very least one can expect under the now court-approved act is that a handful of trouble makers cannot block work until they can muster a majority. Much depends upon the national mood as to observance of all laws.

• • •

Respect for law may become the major problem of the present stage of recovery. The passive attitude of President Roosevelt in the face of impudent disregard for the rights of citizens is breeding a social disease akin to anarchy. Encouraged by the apparent blessing of the government, irresponsible youngsters in industry have been quick to indulge in sit-down strikes and other forms of lawlessness. Once the public press and public opinion showed sympathy for these tactics, hords of hoodlums, grafters, gangsters, communists, etc., flocked to the scene. Here, hiding under the cloak of labor, they took the lead in trouble making.

Respect for Law Is Issue

• • •

The chief danger in this deplorable mess is not in the initial outrage against law and order. As is inevitable in all cases of direct action and rebellion, the counter-revolution is fiercer than the revolution. One hates to think of what would happen if the millions of honest, peaceful workers who have been deprived of wages because of strikes fomented by outsiders should suddenly awake to the cruel truth as to the extent they have been victimized. The reaction would be something like a million Hershey incidents rolled into one violent, viligante orgy. Fortunately, President Roosevelt still has a chance to halt the dangerous trend toward a complete breakdown of law and order. No political motives nor promises to Mr. Lewis—actual or implied—should stand in the way of a prompt warning against unwarranted lawlessness.

President Can Ban Anarchy

• • •

The week's news from abroad holds special interest for American industries. With an output of 1,109,500 tons of ingots in March (p. 108), British steelworks established an all-time production record. . . . Representatives of ten European countries have formed a buying cartel (p. 23) to reduce competition in the purchase of raw materials abroad. The influence of this organization will be felt in the international markets for iron and steel scrap. Scrap prices (p. 87) are easier, and in the United States the question of restricting scrap exports (p. 23) still is being debated actively. . . . Amendments to the obnoxious Walsh-Healey government contract act have been introduced in both houses of congress. One amendment (p. 36) would reduce the contract price of transactions affected from $10,000 to $2500.

New Record for England

• • •

First quarter earnings reported by several leading independent steel producers (p. 21) reflect the gratifying effect of a high rate of operations in relation to capacity. President Grace of Bethlehem intimated that consideration of a common dividend is imminent. Chairman Girdler of Republic was able to report that the company earned more in the first quarter of 1937 than in the entire year of 1935. President Hook estimated a sharp gain in the first quarter earnings of American Rolling Mill Co. over those of the same quarter in 1936. . . . In spite of current labor disturbances, industrial activity continues to show impressive stability. STEEL'S index (p. 38) stand at 112.5. . . . Steelworks operations (p. 22) continue at 91.5 per cent of capacity.

Index Shows Stability

E. L. Shaner

BEHIND THE INLAND LADLE

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Inland's ability to produce uniformly high quality steel extends beyond modern mills and furnaces. It includes control over raw materials.

High-grade ore from Minnesota and Michigan ore properties; limestone that averages better than 96% calcium—these come by relatively short haul to Indiana Harbor in freighters operated on the lakes by Inland. Inland's Wheelwright mines in eastern Kentucky provide the finest coking Elkhorn coal. Coke is made near the blast furnaces at the Indiana Harbor plant.

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Challenge CIO's "Majority" in Steel; New Workers' Unions To Seek Referendum

WITH the national labor relations board now holding broad power in connection with collective bargaining in steel and other industries as a result of the Supreme Court's decision upholding the national labor relations act, the question of majority rule among employes assumes new importance.

Taking a long range view, many leaders in the steel industry believe that legislation for the control of labor unions will be one result of the act's validation.

While some steelmakers interpreted last week's decision as the start of a downward economic cycle, others believed the decision might solve many problems and likely to result in a period of stability, compared with events in the last few months. Those expressing the latter belief pointed to the coal mining industry and its negotiations with the CIO as an example of what they meant.

Foresee Union Incorporation

Ultimately, many steelmakers look for the incorporation of labor unions and the recognition by the government of its obligation to see that labor lives up to its contracts.

The decision is considered generally as having done much toward ending the struggle over the Supreme Court. Centralization in government, it is said, is likely to be increased. In some quarters the view was expressed that the labor act will be amended eventually.

The ruling foreshadows a period of uncertainty for some individual companies. Constitutionality of the application of the act must be determined as individual cases arise. Section 9 provides that "Representatives designated or selected for the purposes of collective bargaining by the majority of the employes in a unit appropriate for such purposes, shall be the exclusive representatives of all the employes in such unit for the purposes of collective bargaining in respect to rates of pay, hours of employment, or other conditions of employment."

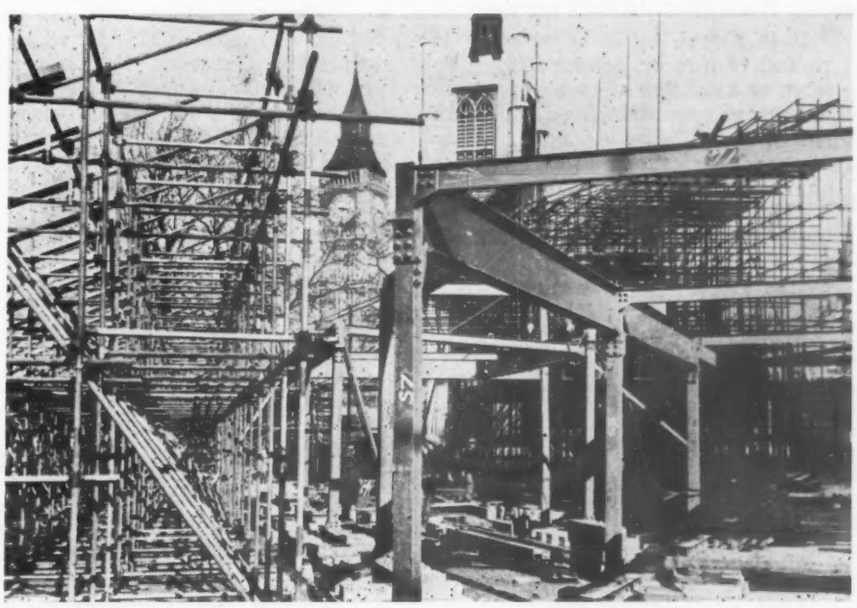
The labor board determines the appropriate unit for collective bargaining.

The CIO, or any other organization, now faces the necessity of proving whether it represents the majority of workers. In some quarters it is believed existing contracts with the CIO may be jeopardized.

However, because of the lack of finances, other organizations, such as the newly formed American Union of Steelworkers which has been conducting a membership drive in plants of Carnegie-Illinois Steel Corp., will be handicapped in their efforts to obtain majorities. Financial support from employers to employe organizations is prohibited. Despite the odds against them, some employe groups indicate they may make an effort to continue.

"Despite greatly exaggerated claims to membership, the CIO has made little progress in organizing the steelworkers of the Carnegie-Illinois Steel Corp.," said Ralph H. Martin, of the new American union. "This was clearly shown in an election of employe representatives at Farrell, Pa., recently when 70 per cent of the employes in the departments cast ballots. Contrasted with this, in a recent election of officers at the Homestead lodge of the CIO, only 1900 employes from that plant participated in the election. Twelve

Steel "All Set" for the Coronation



A MAZE of steel scaffolding in the form of tubes and shapes has been erected outside Westminster Abbey, London, for the coronation ceremonies May 12. The framework on which the flooring and thousands of seats will be placed almost hides from view the "Big Ben" clock tower of the houses of parliament, and the tower of St. Margaret's church. Wide World photo

thousand men are employed at the Homestead plant."

The new American union, with dues of 25 cents per month compared to the CIO's $1 per month, has already signed up 1000 employes in Carnegie-Illinois plants, according to Martin.

"As soon as possible the American Union of Steel Workers will demand a referendum to decide whether that organization or the CIO will bargain for employes of the Carnegie-Illinois Steel Corp.," said Martin. "When this happens the CIO under the labor act will be compelled to step out of the picture and we will again have peace in the steel industry."

Martin intimated that employe representatives of several independent steel companies had approached him with regard to merging their efforts.

Meanwhile, the CIO was reported to have sent letters to 200 organizers in the steel industry, in an effort to obtain evidence against employers who may have violated the labor act.

The act states that employes shall have the right to self organization, to form, join or assist labor organizations, and to bargain collectively through representatives of their own choosing.

Employers may not interfere with, restrain or coerce employes in the exercise of the rights guaranteed in the declaration of policy. It is illegal to dominate or interfere with the formation or administration of any labor organization, or contribute financial or other support to it.

Must Bargain Collectively

It is illegal, by discrimination in regard to hire or tenure of employment or condition of employment, to encourage or discharge membership in any labor organization; to discharge or otherwise discriminate against an employe because he has filed charges or given testimony under the act; to refuse to bargain collectively with the representatives of his employes.

The act sets up a labor relations board of three members to enforce its provisions and to conduct elections among employes when a dispute arises as to which of two or more labor organizations represent a majority of the employes for collective bargaining.

Attorney E. F. Reed, Pittsburgh, counsel for Jones & Laughlin Steel Corp. in the case which the court decided, said:

"The majority of the Supreme Court in this decisioin applies the act to a company which is so extensively engaged in trade that its labor disputes might be a burden upon interstate commerce. Apparently, each case will depend on its own facts and it will be very difficult to know when the law applies.

"The decision endorses majority rule and will cut both ways. Where the union is the minority group it will have no right to bargain, even for its own members, an interpretation much narrower than industry was willing to concede.

"In view of this decision, it will be interesting to see if congress will exercise its newly defined power over labor and end the strife we have recently been experiencing and protect those workers who do not desire unionization."

The Jones & Laughlin suit was started by the board in April, 1936, when it went to New Orleans and filed an enforcement order in the fifth district court in an effort to restrain Jones & Laughlin from alleged "unfair" labor practices.

Right to Protect Commerce

The court held that congress had the power under the constitution's interstate commerce clause to make laws to protect commerce. It held that strikes in manufacturing plants, such as those involved in the test cases, would hamper commerce and that since the act was intended to prevent strikes, it was a lawful exercise of constitutional power.

The ruling does not mean that all employes must join unions, nor does it require an employer to sign an agreement. It does, however, compel him to meet and bargain with the representatives of his employes.

In the majority opinion, the court held that:

"The act does not compel agreements between employers and employes. It does not compel any agreement whatever. It does not prevent the employer 'from refusing to make a collective contract and hiring individuals on whatever terms' the employer 'may be unilateral action determine.' The act expressly provides in Section 9 (A) that any individual employe or a group of employes shall have the right at any time to present grievances to their employer. The theory of the act is that free opportunity for negotiations with accredited representatives of employes is likely to promote industrial peace and may bring about the adjustments and agreements which the act in itself does not attempt to compel."

Facilities for mediation are provided both by the labor board, created by the Wagner act, and by the department of labor, but acceptance of their services is entirely voluntary.

Many cases were pending before the labor board at the time of the Supreme Court's ruling, such as the proceedings against Carnegie-Illinois Steel Corp., based on charges by the Steel Workers' Organizing committee that the employe representation plan of Carnegie-Illinois is illegal under the Wagner law.

SWOC REPORTS MORE CONTRACTS, NEGOTIATIONS

The Steel Workers Organizing committee announced last week that with the signing of W. J. Holliday & Co., Hammond, Ind.; Crown Pipe & Foundry Co., Jackson, O.; Walworth Co., Greensburg, Pa.; and Caterpillar Tractor Co., Peoria, Ill., its total number of contracts is 59. At the same time the SWOC announced settlement of two strikes, at the Coshocton Iron Works, Monongahela, Pa., and Hubbard Co., Pittsburgh.

It also said that "conferences with Youngstown Sheet & Tube Co. will open in Youngstown, April 20 . . . conferences scheduled with Crucible Steel Co. were postponed due to the death of H. S. Wilkinson . . . conferences with Mesta Machine Co. are going forward."

Meetings which the SWOC claimed to have scheduled with Jones & Laughlin Steel Corp. were postponed "until next Monday or Tuesday when H. E. Lewis, chairman of Jones & Laughlin returns to Pittsburgh." It reported that "preliminary conferences were held with Bethlehem Steel Corp. last Tuesday."

CIO PROTESTS CHARTER FOR INDEPENDENT UNION

When employes of Lukens Steel Co., Coatesville, Pa., proposed to incorporate a new independent union, divorced from company and other labor organizations alike, CIO officials were quick to protest.

Lukens employes, informed their employe representatives would not be recognized under the national labor relations act, voted to organize independently as the Lukens Employes association. Desiring a responsible legal body with regular accounting of funds, members applied for a charter of incorporation.

Frustrated CIO officials, seeking new members in the Coatesville area, filed a lengthy protest against granting the charter. The new union, the protest read, would "create animosity and discord and conflict among employes," its incorporation would be "contrary to public policy." CIO officials further alleged the new union was "company dominated," a charge termed "entirely unfounded" by company officials.

"It certainly seems very strange," declared Joseph Lovell, president of the new union, "that Lever (CIO field director) and the CIO which are always urging workers to organize, now want to prevent Lukens employes from forming their own union."

Complete Text of National Labor Relations Act

AN ACT

To diminish the causes of labor disputes burdening or obstructing interstate and foreign commerce, to create a National Labor Relations Board, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

FINDINGS AND POLICY

Section 1. The denial by employers of the right of employes to organize and the refusal by employers to accept the procedure of collective bargaining lead to strikes and other forms of industrial strife or unrest, which have the intent or the necessary effect of burdening or obstructing commerce by (a) impairing the efficiency, safety, or operation of the instrumentalities of commerce; (b) occurring in the current of commerce; (c) materially affecting, restraining, or controlling the flow of raw materials or manufactured or processed goods from or into the channels of commerce, or the prices of such materials or goods in commerce; or (d) causing diminution of employment and wages in such volume as substantially to impair or disrupt the market for goods flowing from or into the channels of commerce.

The inequality of bargaining power between employes who do not possess full freedom of association or actual liberty of contract, and employers who are organized in the corporate or other forms of ownership association substantially burdens and affects the flow of commerce, and tends to aggravate recurrent business depressions, by depressing wage rates and the purchasing power of wage earners in industry and by preventing the stabilization of competitive wage rates and working conditions within and between industries.

Experience has proved that protection by law of the right of employes to organize and bargain collectively safeguards commerce from injury, impairment, or interruption, and promotes the flow of commerce by removing certain recognized sources of industrial strife and unrest, by encouraging practices fundamental to the friendly adjustment of industrial disputes arising out of differences as to wages, hours, or other working conditions, and by restoring equality of bargaining power between employers and employes.

It is hereby declared to be the policy of the United States to eliminate the causes of certain substantial obstructions to the free flow of commerce and to mitigate and eliminate these obstructions when they have occurred by encouraging the practice and procedure of collective bargaining and by protecting the exercise by workers of full freedom of association, self-organization, and designation of representatives of their own choosing, for the purpose of negotiating the terms and conditions of their employment or other mutual aid or protection.

DEFINITIONS

Sec. 2. When used in this Act—

(1) The term "person" includes one or more individuals, partnerships, associations, corporations, legal representatives, trustees, trustees in bankruptcy, or receivers.

(2) The term "employer" includes any person acting in the interest of an employer, directly or indirectly, but shall not include the United States, or any State or political subdivision thereof, or any person subject to the Railway Labor Act, as amended from time to time, or any labor organization (other than when acting as an employer), or anyone acting in the capacity of officer or agent of such labor organization.

(3) The term "employe" shall include any employe, and shall not be limited to the employes of a particular employer, unless the Act explicitly states otherwise, and shall include any individual whose work has ceased as a consequence of, or in connection with, any current la-

Members of Board Which Administers Labor Relations Act

J. Warren Madden

J. Warren Madden, 47, chairman of the board, was born in Damascus, Ill., educated in law, former professor in these universities: Oklahoma, Ohio State, West Virginia, Pittsburgh, Leland-Stanford, Chicago and Cornell. He has been active in Pittsburgh social work

Edwin S. Smith

Edwin S. Smith, 45, is a native of Brookline, Mass., former newspaperman, supervisor of a chain of retail shoe stores, member of the staff of the Russell Sage Foundation; employment manager, Filene store, Boston; specialist in labor law and employe relations

Donald Wakefield Smith

Donald Wakefield Smith, 38, Philadelphia lawyer, Georgetown university graduate, worked during vacations in steel mills, practiced labor law in Washington. Grandfather was steel chemist; father is assistant superintendent, Duquesne Steel Foundry Co.

bor dispute or because of any unfair labor practice, and who has not obtained any other regular and substantially equivalent employment, but shall not include any individual employed as an agricultural laborer, or in the domestic service of any family or person at his home, or any individual employed by his parent or spouse.

(4) The term "representatives" includes any individual or labor organization.

(5) The term "labor organization" means any organization of any kind, or any agency or employe representation committee or plan, in which employes participate and which exists for the purpose, in whole or in part, of dealing with employers concerning grievances, labor disputes, wages, rates of pay, hours of employment, or conditions of work.

(6) The term "commerce" means trade, traffic, commerce, transportation, or communication among the several States, or between the District of Columbia or any Territory of the United States and any State or other Territory, or between any foreign country and any State, Territory, or the District of Columbia, or within the District of Columbia or any Territory, or between points in the same State but through any other State or any Territory or the District of Columbia or any foreign country.

(7) The term "affecting commerce" means in commerce, or burdening or obstructing commerce or the free flow of commerce, or having led or tending to lead to a labor dispute burdening or obstructing commerce or the free flow of commerce.

(8) The term "unfair labor practice" means any unfair labor practice listed in section 8.

(9) The term "labor dispute" includes any controversy concerning terms, tenure or conditions of employment, or concerning the association or representation of persons in negotiating, fixing, maintaining, changing, or seeking to arrange terms or conditions of employment, regardless of whether the disputants stand in the proximate relation of employer and employe.

(10) The term "National Labor Relations Board" means the National Labor Relations Board created by section 3 of this Act.

(11) The term "old Board" means the National Labor Relations Board established by Executive Order Numbered 6763 of the President on June 29, 1934, pursuant to Public Resolution Numbered 44, approved June 19, 1934 (48 Stat. 1183), and re-established and continued by Executive Order Numbered 7074 of the President of June 15, 1935, pursuant to Title I of the National Industrial Recovery Act (48 Stat. 195) as amended and continued by Senate Joint Resolution 133[1] approved June 14, 1935.

NATIONAL LABOR RELATIONS BOARD

Sec. 3. (a) There is hereby created a board, to be known as the "National Labor Relations Board" (hereinafter referred to as the "Board"), which shall be composed of three members, who shall be appointed by the President, by and with the advice and consent of the Senate. One of the original members shall be appointed for a term of one year, one for a term of three years, and one for a term of five years, but their successors shall be appointed for terms of five years each, except that any individual chosen to fill a vacancy shall be appointed only for the unexpired term of the member whom he shall succeed. The President shall designate one member to serve as chairman of the Board. Any member of the Board may be removed by the President, upon notice and hearing, for neglect of duty or malfeasance in office, but for no other cause.

(b) A vacancy in the Board shall not impair the right of the remaining members to exercise all the powers of the Board, and two members of the Board shall, at all times constitute a quorum. The Board shall have an official seal which shall be judicially noticed.

(c) The Board shall at the close of each fiscal year make a report in writing to Congress and to the President stating in detail the cases it has heard, the decisions it has rendered, the names, salaries, and duties of all employes and officers in the employ or under the supervision of the Board, and an account of all moneys it has disbursed.

Sec. 4. (a) Each member of the Board shall receive a salary of $10,000 a year, shall be eligible for reappointment, and shall not engage in any other business, vocation, or employment. The Board shall appoint, without regard for the provisions of the civil-service laws, but subject to the Classification Act of 1923, as amended, an executive secretary, and such attorneys, examiners, and regional directors, and shall appoint such other employes with regard to existing laws applicable to the employment and compensation of officers and employes of the United States, as it may from time to time find necessary for the proper performance of its duties and as may be from time to time appropriated for by Congress. The Board may establish or utilize such regional, local, or other agencies, and utilize such voluntary and uncompensated services, as may from time to time be needed. Attorneys appointed under this section may, at the direction of the Board, appear for and represent the Board in any case in court. Nothing in this Act shall be construed to authorize the Board to appoint individuals for the purpose of conciliation or mediation (or for statistical work), where such service may be obtained from the Department of Labor.

(b) Upon the appointment of the three original members of the Board and the designation of its chairman, the old Board shall cease to exist. All employes of the old Board shall be transferred to and become employes of the Board with salaries under the Classification Act of 1923, as amended, without acquiring by such transfer a permanent or civil service status. All records, papers, and property of the old Board shall become records, papers, and property of the Board, and all unexpended funds and appropriations for the use and maintenance of the old Board shall become funds and appropriations available to be expended by the Board in the exercise of the powers, authority, and duties conferred on it by this Act.

(c) All of the expenses of the Board, including all necessary traveling and subsistence expenses outside the District of Columbia incurred by the members or employes of the Board under its orders shall be allowed and paid on the presentation of itemized vouchers therefor approved by the Board or by any individual it designates for that purpose.

Sec. 5. The principal office of the Board shall be in the District of Columbia, but it may meet and exercise any or all of its powers at any other place. The Board may, by one or more of its members or by such agents or agencies as it may designate, prosecute any inquiry necessary to its functions in any part of the United States. A member who participates in such an inquiry shall not be disqualified from subsequently participating in a decision of the Board in the same case.

Sec. 6. (a) The Board shall have authority from time to time to make, amend, and rescind such rules and regulations as may be necessary to carry out the provisions of this Act. Such rules and regulations shall be effective upon publication in the manner which the Board shall prescribe.

RIGHTS OF EMPLOYES

Sec. 7. Employes shall have the right to self-organization, to form, join, or assist labor organizations, to bargain collectively through representatives of their own choosing, and to engage in concerted activities, for the purpose of collective bargaining or other mutual aid or protection.

Sec. 8. It shall be an unfair la-

[1] So in original.

bor practice for an employer—

(1) To interfere with, restrain, or coerce employes in the exercise of the rights guaranteed in section 7.

(2) To dominate or interfere with the formation or administration of any labor organization or contribute financial or other support to it: *Provided,* That subject to rules and regulations made and published by the Board pursuant to section 6 (a), an employer shall not be prohibited from permitting employes to confer with him during working hours without loss of time or pay.

(3) By discrimination in regard to hire or tenure of employment or any term or condition of employment to encourage or discourage membership in any labor organization: *Provided,* That nothing in this Act, or in the National Industrial Recovery Act (U. S. C., Supp. VII, title 15, secs. 701-712), as amended from time to time, or in any code or agreement approved or prescribed thereunder, or in any other statute of the United States, shall preclude an employer from making an agreement with a labor organization (not established, maintained, or assisted by any action defined in this Act as an unfair labor practice) to require as a condition of employment membership therein, if such labor organization is the representative of the employes as provided in section 9 (a), in the appropriate collective bargaining unit covered by such agreement when made.

(4) To discharge or otherwise discriminate against an employe because he has filed charges or given testimony under this Act.

(5) To refuse to bargain collectively with the representatives of his employes, subject to the provisions of section 9 (a).

REPRESENTATIVES AND ELECTIONS

Sec. 9. (a) Representatives designated or selected for the purposes of collective bargaining by the majority of the employes in a unit appropriate for such purposes, shall be the exclusive representatives of all the employes in such unit for the purposes of collective bargaining in respect to rates of pay, wages, hours of employment, or other conditions of employment: *Provided,* That any individual employe or a group of employes shall have the right at any time to present grievances to their employer.

(b) The Board shall decide in each case whether, in order to insure to employes the full benefit of their right to self-organization and to collective bargaining, and otherwise to effectuate the policies of this Act, the unit appropriate for purposes of collective bargaining shall be the employer unit, craft unit, plant unit, or subdivision thereof.

(c) Whenever a question affecting commerce arises concerning the representation of employes, the Board may investigate such controversy and certify to the parties, in writing, the name or names of the representatives that have been designated or selected. In any such investigation, the Board shall provide for an appropriate hearing upon due notice, either in conjunction with a proceeding under section 10 or otherwise, and may take a secret ballot of employes, or utilize any other suitable method to ascertain[1] such representatives.

(d) Whenever an order of the Board made pursuant to section 10 (c) is based in whole or in part upon facts certified following an investigation pursuant to subsection (c) of this section, and there is a petition for the enforcement or review of such order, such certification and the record of such investigation shall be included in the transcript of the entire record required to be filed under subsections 10 (e) or 10 (f), and thereupon the decree of the court enforcing, modifying, or setting aside in whole or in part the order of the Board shall be made and entered upon the pleadings, testimony, and proceedings set forth in such transcript.

PREVENTION OF UNFAIR LABOR PRACTICES

Sec. 10. (a) The Board is empowered, as hereinafter provided, to prevent any person from engaging in any unfair labor practice (listed in section 8) affecting commerce. This power shall be exclusive, and shall not be affected by any other means of adjustment or prevention that has been or may be established by agreement, code, law, or otherwise.

(b) Whenever it is charged that any person has engaged in or is engaging in any such unfair labor practice, the Board, or any agent or agency designated by the Board for such purposes, shall have power to issue and cause to be served upon such person a complaint stating the charges in that respect, and containing a notice of hearing before the Board or a member thereof, or before a designated agent or agency, at a place therein fixed, not less than five days after the serving of said complaint. Any such complaint may be amended by the member, agent, or agency conducting the hearing or the Board in its discretion at any time prior to the issuance of an order based thereon. The person so complained of shall have the right to file an answer to the original or amended complaint and to appear in person or otherwise and give testimony at the place and time fixed in the complaint. In the discretion of the member, agent or agency conducting the hearing or the Board, any other person may be allowed to intervene in the said proceeding and to present testimony. In any such proceeding the rules of evidence prevailing in courts of law or equity shall not be controlling.

(c) The testimony taken by such member, agent or agency or the Board shall be reduced to writing and filed with the Board. Thereafter, in its discretion, the Board upon notice may take further testimony or hear argument. If upon all the testimony taken the Board shall be of the opinion that any person named in the complaint has engaged in or is engaging in any such unfair labor practice, then the Board shall state its findings of fact and shall issue and cause to be served on such person an order requiring such person to cease and desist from such unfair labor practice, and to take such affirmative action, including reinstatement of employes with or without back pay, as will effectuate the policies of this Act. Such order may further require such person to make reports from time to time showing the extent to which it has complied with the order. If upon all the testimony taken the Board shall be of the opinion that no person named in the complaint has engaged in or is engaging in any such unfair labor practice, then the Board shall state its findings of fact and shall issue an order dismissing the said complaint.

(d) Until a transcript of the record in a case shall have been filed in a court, as hereinafter provided, the Board may at any time, upon reasonable notice and in such manner as it shall deem proper, modify or set aside, in whole or in part, any finding or order made or issued by it.

(e) The Board shall have power to petition any circuit court of appeals of the United States (including the Court of Appeals of the District of Columbia), or if all the circuit courts of appeals to which application may be made are in vacation, any district court of the United States (including the Supreme Court of the District of Columbia), within any circuit or district, respectively, wherein the unfair labor practice in question occurred or wherein such person resides or transacts business, for the enforcement of such order and for appropriate temporary relief or restraining order, and shall certify and file in the court a transcript of the entire record in the proceeding, including the pleadings and testimony upon which such order was entered and the findings and order of the Board. Upon such filing, the court shall cause notice thereof to be served upon such person, and thereupon shall have jurisdiction of the proceeding and of the

[1] So in original.

question determined therein, and shall have power to grant such temporary relief or restraining order as it deems just and proper, and to make and enter upon the pleadings, testimony, and proceedings set forth in such transcript a decree enforcing, modifying, and enforcing as so modified, or setting aside in whole or in part the order of the Board. No objection that has not been urged before the Board, its member, agent or agency, shall be considered by the court, unless the failure or neglect to urge such objection shall be excused because of extraordinary circumstances. The findings of the Board as to the facts, if supported by evidence, shall be conclusive. If either party shall apply to the court for leave to adduce additional evidence and shall show to the satisfaction of the court that such additional evidence is material and that there were reasonable grounds for the failure to adduce such evidence in the hearing before the Board, its member, agent, or agency, the court may order such additional evidence to be taken before the Board, its member, agent, or agency, and to be made a part of the transcript. The Board may modify its findings as to the facts, or make new findings, by reason of additional evidence so taken and filed, and it shall file such modified or new findings, which, if supported by evidence, shall be conclusive, and shall file its recommendations, if any, for the modification or setting aside of its original order. The jurisdicion of the court shall be exclusive and its judgment and decree shall be final, except that the same shall be subject to review by the appropriate circuit court of appeals if application was made to the district court as hereinabove provided, and by the Supreme Court of the United States upon writ of certiorari or certification as provided in sections 239 and 240 of the Judicial Code, as amended (U. S. C., title 28, secs. 346 and 347).

(f) Any person aggrieved by a final order of the Board granting or denying in whole or in part the relief sought may obtain a review of such order in any circuit court of appeals of the United States in the circuit wherein the unfair labor practice in question was alleged to have been engaged in or wherein such person resides or transacts business, or in the Court of Appeals of the District of Columbia by filing in such court a written petition praying that the order of the Board be modified or set aside. A copy of such petition shall be forthwith served upon the Board, and thereupon the aggrieved party shall file in the court a transcript of the entire record in the proceeding, certified by the Board, including the pleading and testimony upon which the order complained of was entered and the findings and order of the Board. Upon such filing, the court shall proceed in the same manner as in the case of an application by the Board under subsection (e), and shall have the same exclusive jurisdiction to grant to the Board such temporary relief or restraining order as it deems just and proper, and in like manner to make and enter a decree enforcing, modifying, and enforcing as so modified, or setting aside in whole or in part the order of the Board; and the findings of the Board as to the facts, if supported by evidence, shall in like manner be conclusive.

(g) The commencement of proceedings under subsection (e) or (f) of this section shall not, unless specifically ordered by the court, operate as a stay of the Board's order.

(h) When granting appropriate temporary relief or a restraining order, or making and entering a decree enforcing, modifying, and enforcing as so modified or setting aside in whole or in part an order of the Board, as provided in this section, the jurisdiction of courts sitting in equity shall not be limited by the Act entitled "An Act to amend the Judicial Code and to define and limit the jurisdiction of courts sitting in equity, and for other purposes," approved March 23, 1932 (U. S. C., Supp. VII, title 29, secs. 101-115).

(i) Petitions filed under this Act shall be heard expeditiously, and if possible within ten days after they have been docketed.

INVESTIGATORY POWERS

Sec. 11. For the purpose of all hearings and investigations, which, in the opinion of the Board, are necessary and proper for the exercise of the powers vested in it by section 9 and section 10—

(1) The Board, or its duly authorized agents or agencies, shall at all reasonable times have access to, for the purpose of examination, and the right to copy any evidence of any person being investigated or proceeded against that relates to any matter under investigation or in question. Any member of the Board shall have power to issue subpenas requiring the attendance and testimony of witnesses and the production of any evidence that relates to any matter under investigation or in question, before the Board, its member, agent, or agency conducting the hearing or investigation. Any member of the Board, or any agent or agency designated by the Board for such purposes, may administer oaths and affirmations, examine witnesses, and receive evidence. Such attendance of witnesses and the production of such evidence may be required from any place in the United States or any Territory or possession thereof, at any designated place of hearing.

(2) In case of contumacy or refusal to obey a subpena issued to any person, any District Court of the United States or the United States courts of any Territory or possession, or the Supreme Court of the District of Columbia, within the jurisdiction of which the inquiry is carried on or within the jurisdiction of which said person guilty of contumacy or refusal to obey is found or resides or transacts business, upon application by the Board shall have jurisdiction to issue to such a person an order requiring such person to appear before the Board, its member, agent, or agency, there to produce evidence if so ordered, or there to give testimony touching the matter under investigation or in question; and any failure to obey such order of the court may be punished by said court as a contempt thereof.

(3) No person shall be excused from attending and testifying or from producing books, records, correspondence, documents, or other evidence in obedience to the subpena of the Board, on the ground that the testimony or evidence required of him may tend to incriminate him or subject him to a penalty or forfeiture; but no individual shall be prosecuted or subjected to any penalty or forfeiture for or on account of any transaction, matter, or thing concerning which he is compelled, after having claimed his privilege against self-incrimination, to testify or produce evidence, except that such individual so testifying shall not be exempt from prosecution and punishment for perjury committed in so testifying.

(4) Complaints, orders, and other process and papers of the Board, its member, agent, or agency, may be served either personally or by registered mail or by telegraph or by leaving a copy thereof at the principal office or place of business of the person required to be served. The verified return by the individual so serving the same setting forth the manner of such service shall be proof of the same, and the return post office receipt or telegraph receipt therefor when registered and mailed or telegraphed as aforesaid shall be proof of service of the same. Witnesses summoned before the Board, its member, agent, or agency, shall be paid the same fees and mileage that are paid witnesses in the courts of the United States,

and witnesses whose depositions are taken and the persons taking the same shall severally be entitled to the same fees as are paid for like service in the courts of the United States.

(5) All process of any court to which application may be made under this Act may be served in the judicial district wherein the defendant or other person required to be served resides or may be found.

(6) The several departments and agencies of the Government, when directed by the President, shall furnish the Board, upon its request, all records, papers, and information in their possession relating to any matter before the Board.

Sec. 12. Any person who shall willfully resist, prevent, impede, or interfere with any member of the Board or any of its agents or agencies in the performance of duties pursuant to this Act shall be punished by a fine of not more than $5000 or by imprisonment for not more than one year, or both.

LIMITATIONS

Sec. 13. Nothing in this Act shall be construed so as to interfere with or impede or diminish in any way the right to strike.

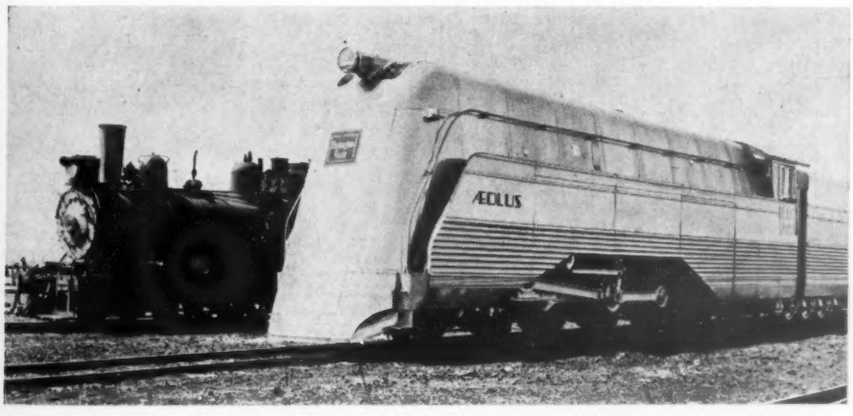
Sec. 14. Wherever the application of the provisions of section 7 (a) of the National Industrial Recovery Act (U. S. C., Supp. VII, title 15, sec. 707 (a)), as amended from time to time, or of section 77 B, paragraphs (l) and (m) of the Act approved June 7, 1934, entitled "An Act to amend an Act entitled 'An Act to establish a uniform system of bankruptcy throughout the United States' approved July 1, 1898, and Acts amendatory thereof and supplementary thereto" (48 Stat. 922, pars. (1) and (m)), as amended from time to time, or of Public Resolution Numbered 44, approved June 12, 1934 (48 Stat. 1183), conflicts with the application of the provisions of this Act, this Act shall prevail: *Provided*, That in any situation where the provisions of this Act cannot be validly enforced, the provisions of such other Acts shall remain in full force and effect.

Sec. 15. If any provision of this Act, or the application of such provision to any person or circumstance, shall be held invalid, the remainder of this Act, or the application of such provision to persons or circumstances other than those to which it is held invalid, shall not be affected thereby.

Sec. 16. This Act may be cited as the "National Labor Relations Act."

Approved, July 5, 1935.

Stainless, High Tensile Steels in Newest of Locomotives



BIG brother of the Zephyr train power unit, which it resembles somewhat in appearance, the Aeolus locomotive was recently completed by the Chicago, Burlington & Quincy railroad at its West Burlington, Iowa, shops. Also deriving its name from Greek mythology — Aeolus means "keeper of the winds"—its chief difference from the Zephyr type is that it is steam-powered.

Streamlined sheathing of stainless steel almost completely encases locomotive and tender. Use of high-tensile steel has effected a marked reduction in weight of reciprocating parts and driving rods. At high speeds the moving parts normally set up considerable vibration in the locomotive and exert a pounding action on the track. High-tensile steel permits a reduction in weight without sacrificing strength and with liberal employment of roller bearings, rail pounding by the Aeolus at 100 miles an hour is said to be only one-third that experienced by conventional equipment.

Locomotive and tender ready for service weigh 400 tons compared with 216 tons for the two-car Zephyr power unit. The Aeolus will be used on the Chicago-Denver run, 1034 miles in 16 hours.

Financial

A FORECAST of continued good business in the current quarter and a consideration of common dividend payment at the quarterly meeting April 29 was made by President Eugene G. Grace at the annual stockholders' meeting of the Bethlehem Steel Corp. in Wilmington, Del., last week.

Mr. Grace said the first quarter registered improved earnings, "reflecting the still increasing volume of business which was evidenced progressively through the year of 1936." Orders on hand, he stated, indicate at least the maintenance of these conditions through the second quarter.

Mr. Grace pointed out that "the new wage rates provide average annual earnings of $1900 per employe, assuming the present average working hours continue.

A tense situation arose when two stockholders who have tried on previous occasions to force changes in the corporation's program, sought to oust Charles M. Schwab as chairman and make him "honorary president" at a salary of $25,000 a year, instead of the $200,000 he now receives. This was voted down by 2,636,908 shares, against a total of 269 shares.

REPUBLIC'S FIRST QUARTER EARNINGS EXCEED ALL 1935

Republic Steel Corp., Cleveland, made more money during the first quarter of 1937 than during the entire year 1935, T. M. Girdler, chairman, announced last week at the stockholders' annual meeting in Jersey City, N. J. Exact amount of first quarter earnings was not disclosed; 1935 profit aggregated $4,455,735.

Mr. Girdler also remarked that the company "should do pretty well in the rest of the year and have a good volume of business." He said: "We are getting very much closer to the time when we will be able to pay something to common stockholders."

Maintenance of first quarter rate of operations and earnings throughout the year would bring Republic's annual profit to $20,000,000 or even more, it was estimated on the basis of the statements made by Mr. Girdler.

ROLLING MILL STOCKHOLDERS AUTHORIZE $60,000,000 ISSUE

American Rolling Mill Co.'s stockholders last week authorized the issuance of $60,000,000 preferred stock, of which $45,000,000 cumulative convertible preferred is proposed to be issued to retire present outstanding indebtedness, increase

production facilities and enlarge working capital. Most of the balance will be used for improvements as previously outlined.

First quarter earnings, Charles R. Hook, president, told stockholders, are estimated at something over $2,000,000. This will be equal to between 70 and 75 cents a share on 2,868,470 shares outstanding, compared with 32 cents on 2,245,192 outstanding at the end of the same quarter in 1936. March will show earnings of more than $1,000,000, highest for any one month.

INLAND WILL SELL SHARES, BUILD FIVE OPEN HEARTHS

Inland Steel Co., Chicago, plans to offer 74,950 shares of capital stock to stockholders, proceeds from the sale of which will be used, with other money in treasury, for extensions and improvements to plants and for other corporate purposes.

Principal extensions will be building of five more open-hearth furnaces. This will give Inland 36 open-hearth units, representing an increase of nine furnaces in two years. Building of four furnaces last year raised the company's ingot capacity 340,000 tons to a total of 2,340,000. The additional five furnaces will bring capacity to around 2,750,000 tons.

The stock offering will not necessitate any increase in the authorized capital stock, now 1,600,000 shares, of which 1,499,000 are issued. Stockholders will vote on the proposal at the annual meeting April 27.

EARNINGS STATEMENTS

A. M. Castle & Co., Chicago, steel warehouse sellers, reports for first quarter record net earnings of $298,000 compared with $95,150 for the corresponding 1936 quarter. Profits were 57 per cent ahead of the first period of 1929.

* * *

Stockholders of Pittsburgh Screw & Bolt Corp., Pittsburgh, approved a bond issue of $1,500,000 4¼ per cent first mortgage bonds and $700,000 in five serial notes which will average 3.25 per cent. The money will be used to redeem $2,205,000 bonds now outstanding. William G. Costin, chairman, said the company earned 36 cents a share in the first quarter, compared with 11 cents a year ago.

* * *

First quarter report of Rustless Iron & Steel Corp., Baltimore, Md., shows a net profit of $171,012, compared with $54,019 in the quarter last year. Net sales during the period were more than double the 1936 quarter.

* * *

Independent Pneumatic Tool Co. and subsidiaries showed an increase of 25 per cent over 1935 to earn $1,096,271.65 during the year 1936. The earnings were larger than any year since 1929, and compare with $879,667.37 in 1935. Net income amounted to $5.83 per share, as against $4.68 per share in the preceding year.

* * *

M. A. Hanna Co., Cleveland, reports net income for the first quarter were $494,014, equal to 32 cents a share on the 1,016,961 common shares, after payment of $162,026 on preferred. In the similar period last year net income totaled $430,372, equaling 26 cents a share after preferred dividends.

* * *

Cliffs Corp., Cleveland, in the first quarter had a net profit of $165,415, compared with $67,481 last year. Directors declared a dividend of 20 cents a share on common voting certificates payable April 30 to record April 20. Cleveland Cliffs Iron Co., controlled by Cliffs Corp., reports net profit of $103,499 for the quarter, exclusive of surtax, comparing with net loss of $72,180 in the period last year.

* * *

Westinghouse Electric & Mfg. Co., Pittsburgh, for the 12 months ending March 31 reports net income of $16,708,349, representing a 25 per cent increase over the comparable period a year ago.

Production

FOR the second consecutive week ingot operations held at 91½ per cent, reflecting steady operating schedules in practically all steelmaking centers. Youngstown and Cincinnati eased off slightly but this was offset by increases at Cleveland, Buffalo and New England.

New England—Up 2 points to 97 per cent, with indications that all units will be operating this week at capacity.

Cleveland-Lorain — Averaged 76½ per cent, up 2½ points. This was due to Republic Steel Corp. adding one unit to operate 13.

Pittsburgh—Held at 95 per cent, highest point since 1929, for the third consecutive week. Blast furnace operations showed no change, 48 stacks being active.

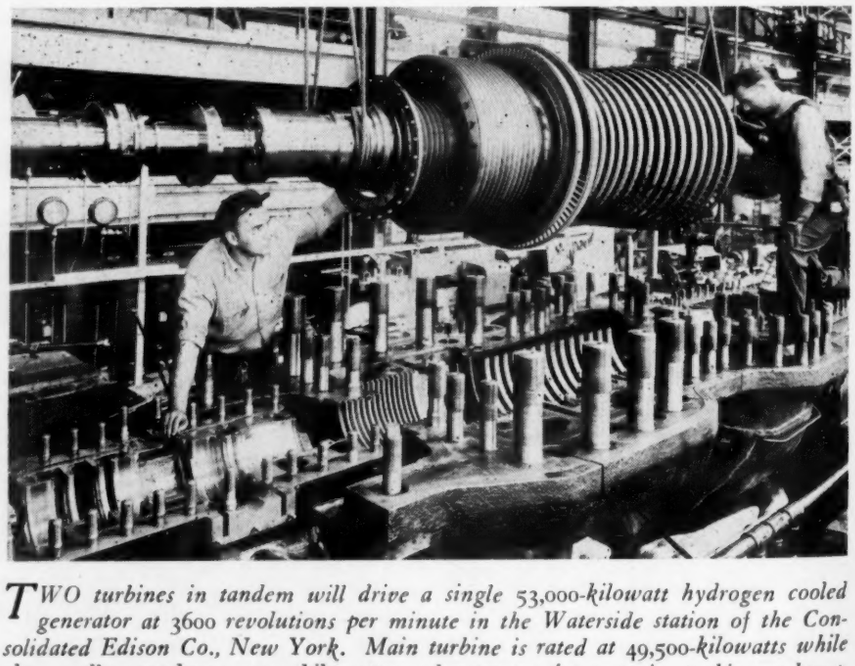
Wheeling — Production continued at 96 per cent.

Cincinnati—Dropped 4 points to 86 per cent, when one open hearth was taken off for repairs, leaving 20 active.

Central eastern seaboard—Operations continued at 59 to 60 per cent. New orders are coming in at a rate about equal to production.

Chicago—Steady at 84 per cent, though mills are using all of the facilities available for operation. A further increase is scheduled this week as a result of the lighting of additional open hearths at Gary.

Tandem Turbine Is Power Plant Innovation



TWO turbines in tandem will drive a single 53,000-kilowatt hydrogen cooled generator at 3600 revolutions per minute in the Waterside station of the Consolidated Edison Co., New York. Main turbine is rated at 49,500-kilowatts while the smaller produces 3500 kilowatts and operates from main turbine exhaust. This arrangement is considered an important innovation in power plant engineering. Shown above is the rotor of the main turbine being lowered into the cylinder. Photo courtesy Westinghouse Electric & Mfg. Co.

Thirty-one of 39 blast furnace stacks are active.

Birmingham—Remained at 80 per cent, with a continuation of this level expected for some time.

St. Louis—Unchanged at 82 per cent, 28 of 33 furnaces melting.

Detroit—Unchanged at 100 per cent.

Buffalo—Gained 2 points to 90 per cent, with 39 open hearths producing.

Youngstown—Off 1 point to 86 per cent, as Sharon Steel Corp. suspended an open hearth at Lowellville for repairs. The furnace will be resumed this week.

District Steel Rate

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended April 17	Change	Same week 1936	Same week 1935
Pittsburgh	95	None	65	36
Chicago	84	None	70½	50
Eastern Pa.	59½	None	43½	29½
Youngstown	86	— 1	80	58
Wheeling	96	None	84	76
Cleveland	76½	+ 2½	84½	62
Buffalo	90	+ 2	65	37
Birmingham	80	None	69	54½
New England	97	+ 2	78	52
Detroit	100	None	100	82
Cincinnati	86	— 4	80	†
St. Louis	82	None	†	†
Average	91½	None	70½	46

†Not reported.

Steel and Wire Takes Back, Starts Cleveland Stack

Production of pig iron has been resumed in stack D at Central Furnaces of the American Steel & Wire Co., Cleveland, after idleness since May 30, 1931. Coke ovens at the plant, idle since the Newburgh steelworks was scrapped in 1935, also are back in production.

The plant formerly had four stacks. A and C were scrapped in 1935. D was rehabilitated at that time and with stack B was taken over by Carnegie-Illinois Steel Corp. The intention was to produce merchant pig iron, but conditions did not warrant blowing it in.

Stack D is to be taken back by Steel & Wire May 1 and operated to supply the company's requirements in the Cleveland area. In the recent past the wire mills have been supplied semifinished steel from National Tube Co.'s works in Lorain, O., and other Steel corporation plants at Duluth and Donora, Pa. Stack D has annual capacity of 255,000 tons, and stack B 217,000 tons.

European Buyers Form Cartel; New Phase in Scrap Exports

REPRESENTATIVES of steel companies in ten European countries have organized a buying cartel, the Federation of Raw Materials, headquarters in London, to eliminate competition among themselves in purchasing materials abroad. Italy, England, Germany, Poland, Holland, Czechoslovakia, Hungry, Yugoslavia, Sweden and Roumania are included. The agreement is for a year.

A substantial order for scrap is understood to have been placed by the cartel in this country, with several exporters participating. The tonnage is reliably said to have been purchased on a c.i.f. basis, based on an ocean rate of $6 a ton to England. The federation, it is reported, will pay the difference where shipment is to be made to a country carrying a higher freight rate.

Domestic scrap exporters do not appear to be overly apprehensive with respect to the possibility of lower prices resulting from purchases by the cartel. Japan, the largest buyer of scrap in the United States, is not a member, nor are other foreign buyers, all of whom will compete with the cartel.

Some exporters consider the cartel as a favorable development for its stabilizing influence on prices, timely in view of consumers' agitation for curtailment of exports. They look for a "sympathetic relationship" between the cartel and Japan. While not a member, Japan had a representative at the European meeting as official observer.

Domestic prices of scrap have dropped 50 cents to $1 a ton, high prices having attracted heavy supplies from many districts. STEEL's steelworks scrap composite at the close of last week stood at $21, compared with the recent peak of $22.08.

CONSUMERS PLEDGE AID TO CURTAIL SCRAP EXPORTS

The newly organized Independent Steel and Iron Producers Committee on Scrap, which held several regional meetings last week, has obtained pledges of co-operation from more than 150 companies throughout the country in its effort to curtail the exportation of scrap.

Louis J. Brann, former governor of Maine, who was retained by some scrap consumers to represent them in Washington, has drawn a new joint resolution on their behalf which he hopes to have introduced this week. This is broader than the Schwellenbach-Koppleman bills introduced recently in the senate and house, as it takes out the word "plate" and applies the export prohibition to all iron and steel scrap.

The committee is said to be assisting the department of commerce with statistical information and also to be assembling a group of experts to testify at hearings in Washington. John V. N. Reynders, well-known consulting engineer, 120 Broadway, New York, has been retained as technical expert.

The senate committee on military affairs to which the Schwellenbach bill was referred retained Donald Richberg as legal counsel to draft a bill which will more fully define what is meant by scrap, and also provide penalties for violation.

Luntz Resigns, Bonomo Heads Scrap Institute

Following the resignation of Darwin S. Luntz as president of the Institute of Scrap Iron and Steel Inc., New York, last week, Michael V. Bonomo, vice president, succeeded to the presidency, effective April 16.

Mr. Luntz, who is head of the Luntz Iron & Steel Co., Canton, O., resigned at a meeting of the directors in Canton. He was elected for a second term as president at the annual convention in Cincinnati last January. It also was announced that Philip W. Frieder, president, Philip W. Frieder Co., Cleveland, resigned as a director and member of the institute. Both Mr. Luntz and Mr. Frieder have long held offices in the organization.

Mr. Bonomo is treasurer of Schiavone-Bonomo Corp., New York, and has spent 29 years of his life in the scrap iron business, starting as a laborer in a scrap yard. He was one of the founders of the institute in 1928 and has served the institute in various official capacities. During the NRA he was an officer of the national scrap iron code authority.

At Chicago it was announced that W. J. Ross had resigned as a director of the institute's Chicago chapter, and Bennett Kaplan had resigned as chairman of the chapter's welfare committee.

Men of Industry

T M. GIRDLER, who was re-elected chairman of the board, Republic Steel Corp., last week, announced the election of R. J. Wysor as president of the corporation following a meeting of the board. A statement by the corporation said:

"Mr. Girdler has held both the office of chairman and president for the past six years. He will continue as the chief executive officer of Republic in active charge of all its affairs, and Mr. Wysor will have complete supervision of the affairs of the corporation under his direction.

"During the past two years the business of Republic has expanded rapidly through the acquisition of the Corrigan, McKinney Steel Co. and Gulf States Steel Co., and of substantially all the stock of Truscon Steel Co., with the result that Mr. Girdler's duties have been greatly increased."

Mr. Wysor is 51. He has been associated with Republic since its formation in 1930, having been vice president in charge of operations from 1930 to September, 1935, and executive vice president and general manager since that date.

He has been active in the steel business for the past 31 years. Immediately prior to his connection with Republic, he was general manager, Jones & Laughlin Steel Corp., of which corporation Mr. Girdler was then president. When Mr. Girdler resigned to accept the position as Republic's chairman Mr. Wysor went with him.

At the annual meeting of Republic stockholders all present directors were re-elected, and W. H. Coverdale, formerly president, Gulf States Steel Co., W. G. Mather, Cleveland capitalist, and Julius Kahn, vice president of Republic, also were elected to the board.

Stockholders approved the corporation's new pension plan which applies to approximately 75 officers and key employes. These officers and employes will be entitled to receive pensions upon retirement, standard retirement age 65 years. The sum for pension payment is to be provided for the most part by the purchase of annuity or insurance contracts from insurance companies, annual premiums of which will be paid by joint contributions of beneficiaries and the corporation, in the ratio of 60 per cent by the corporation and 40 per cent by employes.

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Tris Speaker, recently appointed representative in Cleveland and central Ohio for the Rotary Electric Steel Co. (Michigan), Detroit, suffered a fractured skull and a broken arm when he fell from the second story porch of his home in Cleveland, April 11.

R. J. Wysor

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M. E. Bash, formerly with Crucible Steel Co. of America, New York, has been named representative for the metropolitan district of New York and New Jersey for the sale of tool steels and drill steels handled by A. Milne & Co. and the Edgar Allen Steel Co. Inc., New York.

♦ ♦ ♦

George O. With has been appointed manager of sales, specialty and concrete bar divisions in the Chicago district for Carnegie-Illinois Steel Corp. After graduating from the University of Illinois in 1915 in civil engineering, Mr. With spent three years with the navy, following which he was successively city engineer for Joliet, Ill., sales manager, Expanded Metal Lath Co., and district sales manager, Concrete Steel Co. He first entered the service of the former Illinois Steel Co. early in 1933 as sales engineer. In his new capacity, he will also handle sheet piling, bearing piles and I-Beam-Lok and T-Tri-Lok flooring.

George O. With

♦ ♦ ♦

P. H. Holton has been added to the sales engineering personnel of the Philadelphia territory of Carboloy Co. Inc., Detroit, maker of cemented carbide tools, dies and wheel dressers. Mr. Schonberger, formerly of the Philadelphia territory, has been transferred to the Newark, N. J., office.

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J. H. Watters, D. J. Shelton and Alex Gibson have been re-elected president and general manager, vice president, and secretary-treasurer, respectively, Marion Steam Shovel Co., Marion, O. A change in the directorate was the election of Arnold Bernhaard, New York, to replace M. C. Brush, New York.

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Lawrence H. Lund has been elected assistant treasurer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. He joined Westinghouse Electric International Co. in January, 1931, as auditor and remained with that organization until his election to office in the parent company. His headquarters will be in Pittsburgh.

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George S. Whyte, president, Macwhyte Co., Kenosha, Wis., producer of wire rope and cable, was tendered a surprise dinner April 10, on his seventieth birthday anniversary by 300 members of the Macwhyte club, employes' association, and presented a greeting plaque signed by every employe.

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Carl C. Brown, formerly general sales manager of Gulf States Steel Co., has been appointed Birmingham district sales manager for Republic Steel Corp., Cleveland. Robert J. Working will be assistant district sales manager, and R. W. Frawley will continue as sales promotion manager for the Birmingham district.

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N. B. Loxterman, Blaw-Knox Co., Pittsburgh, has been elected president, Dust Control Equipment association, Cleveland. Other officers elected are: Vice president, M. A. Eiben, Northern Blower Co., Cleveland; executive secretary-treasurer, Arthur J. Tuscany. The association also appointed an engineering committee to develop standards of dust control practice, and will also be available for consultation by other associations or groups interested in preparation of codes, developments of regulations and the like.

♦ ♦ ♦

Harold H. Oldham has been appointed to the newly created posi-

tion of manager of copy and production in the advertising division, Republic Steel Corp., Cleveland. Previous to joining Republic in 1931, he did market research and account work for Geyer Co., Dayton, O., advertising agency, and before that was associated with Wood Construction Publishing Co., Xenia, O.

♦ ♦ ♦

H. E. Beckman has been elected president, Springfield Facing Co., Springfield, Mass., and Newark, N. J., to succeed the late L. S. Brown. He had been general manager since 1928.

Harold J. Dorus will resign as superintendent of foundries, Yale & Towne Mfg. Co., Stamford, Conn., to become general manager of the Springfield company, with headquarters in Springfield.

♦ ♦ ♦

E. W. Smith has resigned as general manager of sales, Pittsburgh Steel Co., Pittsburgh. W. G. Hume continues as manager of wire products sales, and C. V. Lally continues as manager of seamless steel tube sales. Office of general manager of sales will remain vacant. J. K. Beeson, formerly assistant general superintendent, has been made assistant manager of sales. He will have charge of sales of semifinished steel, pig iron and rods and will assist Messrs. Hume and Lally in sales of wire and tubular products.

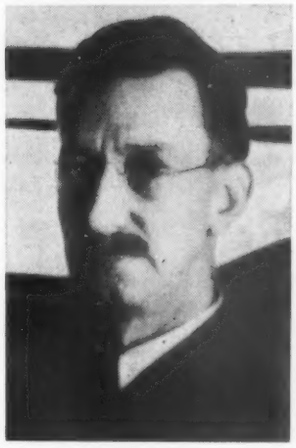
♦ ♦ ♦

Joseph H. Thompson has resigned as first vice president, National City bank, Cleveland, effective April 30, to become vice president and a director, M. A. Hanna Co., Cleveland. R. L. Ireland Jr. and James Prendergast, directors, have been made vice presidents; C. N. Osborne, secretary-treasurer and director, has become vice president and treasurer. W. A. Maier, assistant treasurer, has been elevated to assistant vice president and also treasurer of Susquehanna Collieries Co. W. C. Scott, assistant secretary, has been named secretary, and H. T. Richardson has been made assistant secretary-assistant treasurer.

♦ ♦ ♦

T. P. Riley, superintendent of industrial relations at the Gary sheet and tin mills of Carnegie-Illinois Steel Corp., since July, 1936, has been appointed to a similar position at the new Irvin works of the corporation, now under construction at Pittsburgh. He will be succeeded at Gary by C. D. Henderson, present assistant superintendent of industrial relations. R. A. Critten, foreman in charge of continuous pickling, will succeed Mr. Henderson and the former's position will be filled by C. A. Boughner.

Mr. Riley joined the former American Sheet & Tin Plate Co. at



T. P. Riley

Gary in 1911. After returning from army service he became employment manager at the sheet mill and in 1933 was made management's representative. Mr. Henderson was associated with American Sheet & Tin Plate in the Pittsburgh district from 1906 until 1927 when he went to Gary tin mill as assistant works auditor. He was made management's representative in 1935.

♦ ♦ ♦

D. J. Henecker has been appointed manager of the wire rope sales department, Wickwire Spencer Steel Co., New York, succeeding the late R. H. Cherry. Mr. Henecker, who is 39, joined Wickwire Spencer sales staff as assistant district sales manager at Buffalo in 1932, assuming the managership of that district in 1934 where he remained until his recent appointment. After leaving school, Mr. Henecker served in the field hospital unit of the twenty-seventh division in France and at the close of the war became associated with the Mercantile Marine and the Consolidated Steel Corp. Before joining Wickwire he was identified with the electrical and wire rope sales department of American Steel & Wire Co. for 11 years.

D. J. Henecker

Died:

H S. WILKINSON, 68, chairman, Crucible Steel Co. of America, New York, in Chicago following a heart attack, April 11. Born in Shellsburg, Iowa, he started his career as a real estate dealer. Forty years ago he helped develop the Great Lakes Steamship Co., Buffalo, and founded the Toledo Shipbuilding Co., Toledo, O., having been president of the former and chairman of the latter at his death. Mr. Wilkinson was president of Halcomb Steel Co. which became a part of the Crucible organization in 1911. He was elected chairman of Crucible in 1919. He was a director and honorary vice president, American Iron and Steel institute, and a member, Lake Carriers Association of Cleveland.

♦ ♦ ♦

Arthur J. Skemp, 53, superintendent of hot sheet mills at Gary sheet and tin mills of Carnegie-Illinois Steel Corp. since 1932, April 5.

♦ ♦ ♦

Samuel P. Moore, assistant to the Pittsburgh district sales manager, Carnegie-Illinois Steel Corp., in Pittsburgh, April 5.

♦ ♦ ♦

Carl B. Auel, 67, manager of employes' service, Westinghouse Electric & Mfg. Co., East Pittsburgh, at his home, April 4. He joined Westinghouse in 1895.

♦ ♦ ♦

William J. Morris, 86, former Pittsburgh steel man, in Miami Beach, Fla., April 13. He was a co-founder of the old Morris-Bailey Steel Co., which was merged with Oliver Iron & Steel Co., Pittsburgh, in 1922.

♦ ♦ ♦

William S. Schleman, 48, president, East Dayton Tool & Die Co., Dayton, O., in Punta Gorda, Fla., April 4. He was also president, Toolcraft Products Co., Evansville, Ind., and South Bend Tool & Die Co., South Bend, Ind.

♦ ♦ ♦

Harry F. Shaw, 37, assistant general superintendent of the Clairton works, Carnegie-Illinois Steel Corp., in charge of river transportation, in Glassport, Pa., April 10. He had been in charge of the river fleet since last December, when Commodore A. O. Ackard retired.

♦ ♦ ♦

Frank Hunter Simmons, 62, president, John Simmons Co., New York, jobber in steel and iron pipe and fittings, in that city, April 11. He was also secretary and treasurer, Vulcan Rail & Construction Co., that city, and treasurer, Powhatan Brass & Iron Works.

Meetings

ZINC INSTITUTE TO DEAL WITH GALVANIZING PRACTICE

GALVANIZING practice is scheduled for extended discussion at the annual meeting of the American Zinc institute at Hotel Statler, St. Louis, April 26-27. The recently organized Galvanizers committee will meet simultaneously. Several joint sessions have been arranged.

E. V. Gent, secretary of the institute, will report on promotion work in "better galvanizing" campaign. Papers relating to the market and merchandising of galvanized sheets in the farm field will be discussed by C. L. Cue, United Co-operatives, and C. R. Kimball, Curtis Publishing Co.

Other speakers and their subjects include: "Developments in Galvanizing Wire and Sheets," by U. C. Tainton; "Metallizing or Spraying Zinc," by W. C. Reid; "Use of Pure Zinc in Hot Galvanizing," by J. J. Enlow; "Fluxes," by L. T. Baldwin; "Tube Galvanizing," by P. C. Ely; "Rolls for Galvanizing," by J. A. Succop; and "Inhibitors," by W. G. Trench.

W. R. Ingalls, director, American Bureau of Metal Statistics; and J. F. Froggett, senior editor, *Daily Metal Trade*, will address a general session on trends in the zinc market.

An exhibit will include zinc, zinc coated products and zinc die castings.

FOUNDRYMEN NAME SPEAKER FOR CONVENTION DINNER

Dr. James S. Thomas, president, Chrysler Institute of Engineering, Detroit, and Clarkson College of Technology, Potsdam, N. Y., will be the speaker at the annual dinner of the American Foundrymen's association, May 6, during the forty-first convention and exposition in Milwaukee. He will discuss the influence of the machine on the present industrial era.

PURCHASING AGENTS WILL REVIEW COMMODITY MARKETS

Fourteen commodities, including steel, aluminum, copper, tin, lead, zinc, coal, coke, petroleum, refractories and paint, will be discussed by some of the nation's industrial leaders at the twenty-second international convention of the National Association of Purchasing Agents, William Penn hotel, Pittsburgh, May 24, 27.

Some of the speakers and their subjects are: "Coke and Other By-Products of Coal," by C. J. Ramsburg, vice president, Koppers Co., Pittsburgh; "Petroleum and Its Products," by Dr. P. D. Foote, executive vice president, Gulf Research & Development Corp., Pittsburgh; "Refractories," by J. D. Sullivan, chief chemist, Battelle Memorial institute, Columbus, O.; "Aluminum," by S. K. Colby, vice president, Aluminum Co. of America, Pittsburgh; "Steel Industry," by J. H. Van Deventer, editor, *Iron Age*, New York; "Copper," by A. E. Petermann, vice president, Calumet & Hecla Consolidated Copper Co. of Michigan, New York; "Tin, Lead and Zinc," by C. S. Trench, editor, *American Metal Market*, New York.

About 115 companies will be represented in the show to be held during the convention.

MINING CONGRESS PREPARES FOR TWO CONVENTIONS

American Mining congress will conduct its fourteenth annual coal mining convention and exposition at the Music Hall, Cincinnati, May 17-21. The technical program of the convention will deal with all phases of coal mining, handling and treatment.

More than 150 manufacturers will display mining machinery, equipment and supplies in the exposition which is expected to be the largest of its kind. More than 75,000 square feet of floor space has been reserved.

The Mining congress will hold its annual metal mining convention and exposition, Sept. 6-10, in Salt Lake City, Utah. Julian D. Conover, Munsey building, Washington, is secretary of the congress.

Steel Corp. Shipments Are Largest since 1929

Shipments of finished steel by subsidiaries of the United States Steel Corp. in March totaled 1,414,399 tons, the largest March total since 1929, when they were 1,469,394 tons.

U. S. STEEL CORP. SHIPMENTS
(Inter-company shipments not included)
(Tons)

	1937	1936	1935	1934
Jan.	1,149,918	721,414	534,055	331,777
Feb.	1,133,724	676,315	583,137	385,500
Mar.	1,414,399	783,552	668,056	588,209
April	.....	979,907	591,728	643,009
May	.....	984,097	598,915	745,063
June	.....	886,065	578,108	985,337
July	.....	590,851	547,794	369,938
Aug.	.....	923,703	624,497	378,023
Sept.	.....	961,803	614,933	370,306
Oct.	.....	1,007,417	686,741	343,962
Nov.	.....	882,643	681,820	366,119
Dec.	.....	1,067,365	661,515	418,630
Y'rly adj.	.....	.....	†28,750	†19,907
Total	.....	§10,825,132	7,347,549	5,905,966

*Addition. †Deduction. §Subject to adjustment.

The increase over February is 280,675 tons and over March, last year, 630,847 tons.

Shipments for first quarter total 3,698,041 tons, compared with 2,181,281 tons for the same period in 1936, a gain of 70 per cent. The first quarter total is the largest for that period since 1929.

Machine Tool Orders Make Recovery in March

Machine tool orders made a good recovery in March to exceed both January and February and come within 85 per cent of December, according to the National Machine Tool Builders association, Cleveland. Index of orders rose to 211.6, compared with 165.2 in February, 200.3 in January and 257.7 in December.

Domestic orders topped the two previous months. Foreign orders, only 18 per cent of the total, were slightly under February. First quarter foreign orders exceed slightly those for the final quarter of 1936 and are equal to 37 per cent of foreign business for all of 1936.

Bridges Most Important Structural Steel Outlet

Although demand for structural steel for buildings and other private work is increasing, highway construction continues to afford the most important market, according to an analysis by the American Institute of Steel Construction.

During 1936 more than 1,600,000 tons of fabricated structural steel were produced. Thirty-seven per cent of the total went into railway and highway bridges. Twenty-five per cent went into buildings—governmental, institutional and commercial. A little more than 22 per cent went into erection of new industrial plants.

Only about 3 per cent of the fabricated structural steel sold in 1936 is known to have gone into engineering projects. The remainder, approximately 13 per cent, constituted unclassified odd jobs, all under 50 tons each.

Books Two Roughing Mills

Lewis Foundry & Machine Co., a subsidiary of Blaw-Knox Co., has received a contract from Tennessee Coal, Iron & Railroad Co. for two three-high roughing mills, complete with Lewis roller and catcher tables, for installation at its sheet mills in Fairfield, Ala.

Activities of Steel Users and Makers

BLAW-KNOX CO., Pittsburgh, has acquired the property and business of the Power Piping Co., Pittsburgh, and will operate it as a subsidiary under the name of Power Piping Corp. Organized in 1916, the company has been engaged in design, manufacture and erection of piping for power plants, oil refineries, sewage plants, water works and industrial plants. A sprinkler division was added in 1934, and new fabricating machinery and bending equipment was installed in 1932. William V. Quartz will continue in charge of the plant.

♦ ♦ ♦

Calumet Steel division, Borg Warner Corp., Chicago, has moved its sales and executive offices to 310 South Michigan avenue, Chicago. Headquarters formerly were at 20 North Wacker drive, that city.

♦ ♦ ♦

H. D. Fowler has opened offices at 419 Smith tower, Seattle, as pacific northwest representative of Pittsburgh-Des Moines Steel Co., Chapman Valve Mfg. Co., Ford Meter Box Co., Atlas Mineral Products Co., Badger Meter Co., and others.

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Acme Porcelain Enameling Corp., New York, has purchased the stamping and enameling plant formerly operated by the Philadelphia Porcelain Enameling Corp. and the Camden Stove Co., in Camden, N. J. It will be dismantled and the equipment installed in the Acme plant in New York.

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Harnischfeger Corp., Milwaukee, is establishing a new department to manufacture and distribute weld rods. The old Hercules steel foundry acquired in 1923, but not operated in recent years, is being reconditioned and re-equipped for purposes of the weld rod department, with J. P. Morrissey as sales manager.

♦ ♦ ♦

Fargo Foundry Co., Fargo, N. Dak., is establishing a branch in Minneapolis, to handle the sale and distribution of stokers, oil burners, air conditioning units and furnaces in the territory covering the two Dakotas, eastern Montana, Minnesota, Wisconsin and upper Michigan. A. H. Thornton will be manager of the Minneapolis branch.

♦ ♦ ♦

Coldwell Lawn Mower Co., Newburgh, N. Y., recently redesigned its line of hand and power lawn mowers to lessen vibration and make them operate with maximum efficiency. One of the principal changes is the adoption of models with pneumatic or solid rubber tires and rubber rollers instead of cast iron wheels and rollers.

♦ ♦ ♦

Burnham Boiler Corp., Irvington, N. Y., has added to its heating equipment line a new unit for complete winter and summer air conditioning. It is provided with combination hand and thermostat control. The company also has developed a new portable electric steam radiator mounted on wheels for easy movement to any point at which heat is wanted.

♦ ♦ ♦

Transmission Engineering Co., San Francisco, has been organized by A. A. Pederson, former sales manager, United Iron Works, and S. O. Otrich, of the former S. O. Otrich Co., San Francisco, to serve as a manufacturers' agency. The company represents Stearns Magnetic Mfg. Co., Milwaukee, producer of magnetic separators, clutches, brakes and magnetic equipment.

♦ ♦ ♦

Turner Tanning Machinery Co., Peabody, Mass., manufacturer of hide and leather working machinery, now is using monel metal and stainless steel blades in some of its bladed cylinders used for working out or setting out hides while in process of manufacture. Another improvement by this company is the chromium plating of smooth plates used in plating finished leather.

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In his report at the annual meeting of stockholders, P. W. Litchfield, president, Goodyear Tire & Rubber Co., Akron, O., reported that pneumatic rubber tires are being used increasingly on America's farm implements and tractors instead of steel rims. He estimated that approximately 40,000,000 steel wheels on American farms now constitute a possible market for pneumatic rubber tires.

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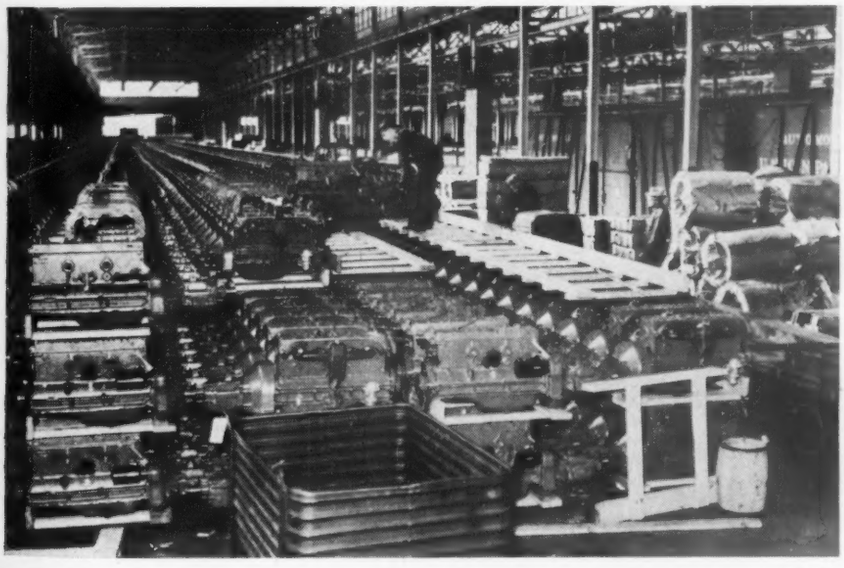
Property of the Steinle Machine Co., Madison, Wis., maker of turret lathes, is being sold at auction by Michael Tauber & Co., 411 South Market street, Chicago. Equipment inventory value was given as $100,000; tools as $10,000, not including 200 tons of tool and cold-rolled steel, 200 tons of lathe parts, 5 tons of bronze bearings and bushings; 13 incomplete Steinle turret lathes, machined and ready to be assembled, and right and title to service and service parts end of the business.

♦ ♦ ♦

Wickwire Bros., Cortland, N. Y., who last year introduced Gray Diamond fabric, made of copper bearing steel wire and fabricated by a special welding process, now are furnishing this fabric in bales containing 150 lineal feet, in widths of 2, 3 and 4 feet, and made to 1-inch mesh in both 18 and 20 gage and to 2-inch mesh in 18 gage wire. Made for all kinds of fence applications, the fabric rolls out flat without curling or bending, and selvage edges are smooth and straight.

14,000 Engines on the Bank



WHILE the strike in General Motors plants tied up assembly lines, this bank of 14,000 Pontiac engines was assembled and tested so they could be dropped in chassis as soon as bodies became available. These engines would supply about two weeks' production of cars. Thousands of other parts likewise were completed and stored preparatory to resuming production

Urges Rational Tax Plan to Stimulate Iron Ore Employment

A BETTER balanced plan of taxation on iron ore in Minnesota to encourage development of the lower grades of ore was advocated by E. W. Davis, of the mines experiment station of the University of Minnesota, as the ore shipping season got under way last week.

His foundation for such a plan is the existence of three fairly distinct grades of iron ore in the great Mesabi range. The first is the relatively small bodies of ore containing 50 per cent of iron, ready for use by blast furnaces. The second contains about 40 per cent of iron, the refining by nature not having proceeded as far, though the rock content has been softened so it can be removed readily in beneficiating plants. The third grade is found in the original rock formation which has not been acted on by water and contains only 30 per cent of iron, and must be treated to make it ready for smelting.

Class I Ore Depleted Half

In the past ore has been taken largely from the deposits of the first class, which are estimated to contain 1.1 billion tons of ore. These have been depleted almost half. Of the second class, which constitutes about 1.3 billion tons, a small start has been made in development, but only a fraction of the ore has been mined and shipped.

The third class has only been touched lightly. It represents 57.2 billions of tons and forms the greatest reserve of the future.

Beneficiating of ores of the second class has been increasing since the beginning of the century until they represent about 39 per cent of total shipments.

Speaking before the Minnesota tax conference, Mr. Davis argued for a change in taxation methods. He answered the question why steel companies should undertake beneficiating low grade ores when there is a 30-year supply of the higher grades. He said that while some steelmakers have a 30-year supply and some even a 50-year reserve, others have only enough for five to ten years. Rather than become dependent on ores from other continents, subject to the contingencies of long ocean transport, they are making the best of their opportunity to conserve their reserves by using as much as possible of the poorer grades.

Under the present tax system every ton of ore in the state is taxed every year and ceases paying taxes only when it is mined and shipped. This encourages removal of as much ore as is practicable every year, to reduce the tax burden.

"But this is not what we want them to do at all," said Mr. Davis. "We want them to work on the lower grade ores, learn how to concentrate them, use more and more of our labor, and eventually get most of their ore requirements from our low grade class II and class III ore materials. We should make it possible for them to conserve the high grade ore for periods of abnormal demand when the concentration plants may not be able to produce high grade ore rapidly enough, since plants of this kind cannot be expanded in a short time.

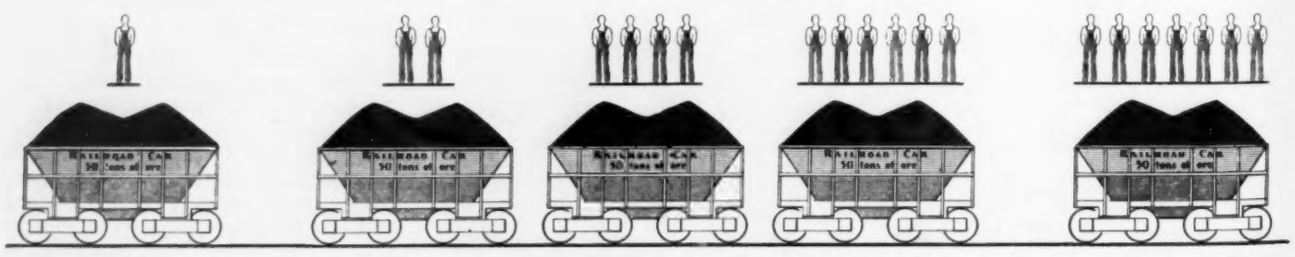
"We are forced to the conclusion, then, that the ad valorem tax, which is the principal tax paid by the mining companies, is a bad tax; bad for the future of the state and bad for the low grade iron ore industry, which is the only industry for which these northern counties are well suited. One tax expert has said that after a ton of iron ore has paid a prescribed tax, the owner should be allowed to leave it in the state as long as he likes without paying any more tax upon it.

"A mining company operating during the winter accumulates a large stock pile near the mine, because it cannot be shipped during the winter. In the spring before the ore can be shipped the assessor comes and because the ore is all mined and perhaps concentrated into a good, high grade product, he puts a high valuation on it for personal property tax purposes. Now, what we really want is to have as much work as possible for our men on the ranges during the winter when most of the mines are shut down. This so-called stock pile tax works directly against winter employment and is, therefore, not a good thing for the range."

More Labor Employed

In the accompanying chart is depicted the number of men required to produce a carload of ore of each class. One man in one day can produce a carload of class I ore from the open-pit mines. It requires two to six men all day to produce an equal quantity of concentrate from class II material, depending on the method employed. Seven men working all day are required for a similar output from the class III iron-bearing rock.

"It is apparent then," continues Mr. Davis, "that the populations of the range communities must increase greatly when the high grade ore is gone and only concentrates are available. There are 100,000 people living on the ranges now, but to produce 30,000,000 tons of concentrates per year this population must increase to 300,000 or more. We should remember the great pile of ore than can be secured from our old, low grade iron-bearing rock. That is the real natural resource of the state, a great ore pile worth more than all the gold in the world."



Approximate number of men working one day required to produce a carload of ore, or concentrate, from each of the three classes of material on the Mesabi range

"Steel Planks" In Small Homes

WITH home building brisk in many parts of the country, the use of steel in houses is now being developed under economic conditions differing from past years.

In Pittsburgh district a house erected of materials developed at the Mellon Institute of Industrial Research by the fellowship maintained by H. H. Robertson Co., Pittsburgh building products manufacturer, has been attracting considerable attention.

Floors in the house are of so-called Robertson steel plank. Walls of the study and entrance hall are of "bonded metal," a substance developed for fastening any type of material, wood or felt, to steel.

The roof is of copper-covered Robertson protected metal, consisting of corrugated steel protected from corrosion by asphalt and asbestos.

How Steel Is Used

The prefabricated steel floors come in sections 2 feet wide and any desired length. They are of cellular construction. The troughs on the upper side of the floor may be filled with concrete, over which flooring of any type is laid. The under side of the floor forms a flat steel ceiling. No subfloor is needed.

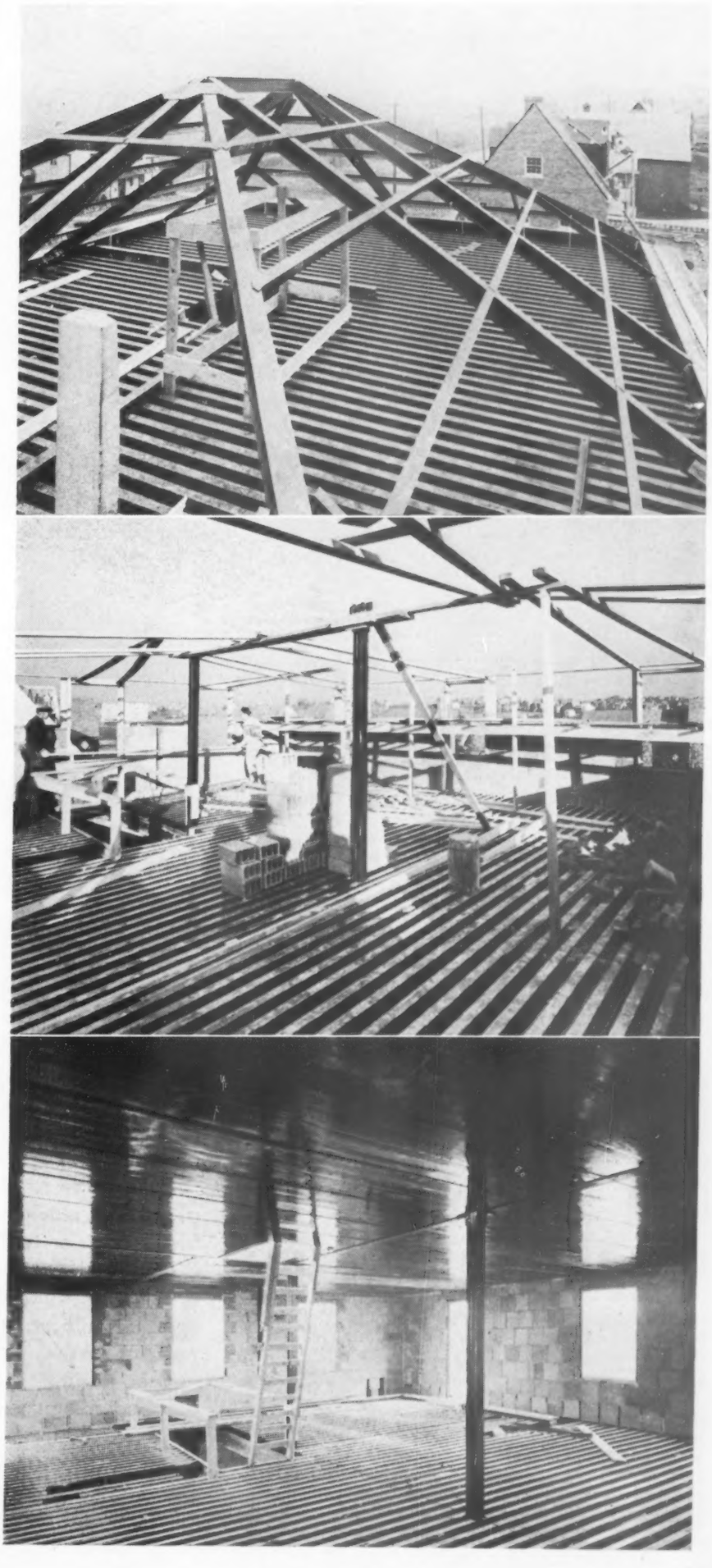
The upper illustration shows the steel plank of the attic floor, over which has been erected the steel framing for the copper-covered protected metal roof. Middle illustration is the second floor, of steel plank, which offers a platform from which all work can be done from inside the house. Lower view is the underside of the attic floor.

The house, which was erected for Dr. A. W. Coffman in Mount Lebanon, a Pittsburgh suburb, is not entirely of steel. Stone, wood, brick and other materials are used.

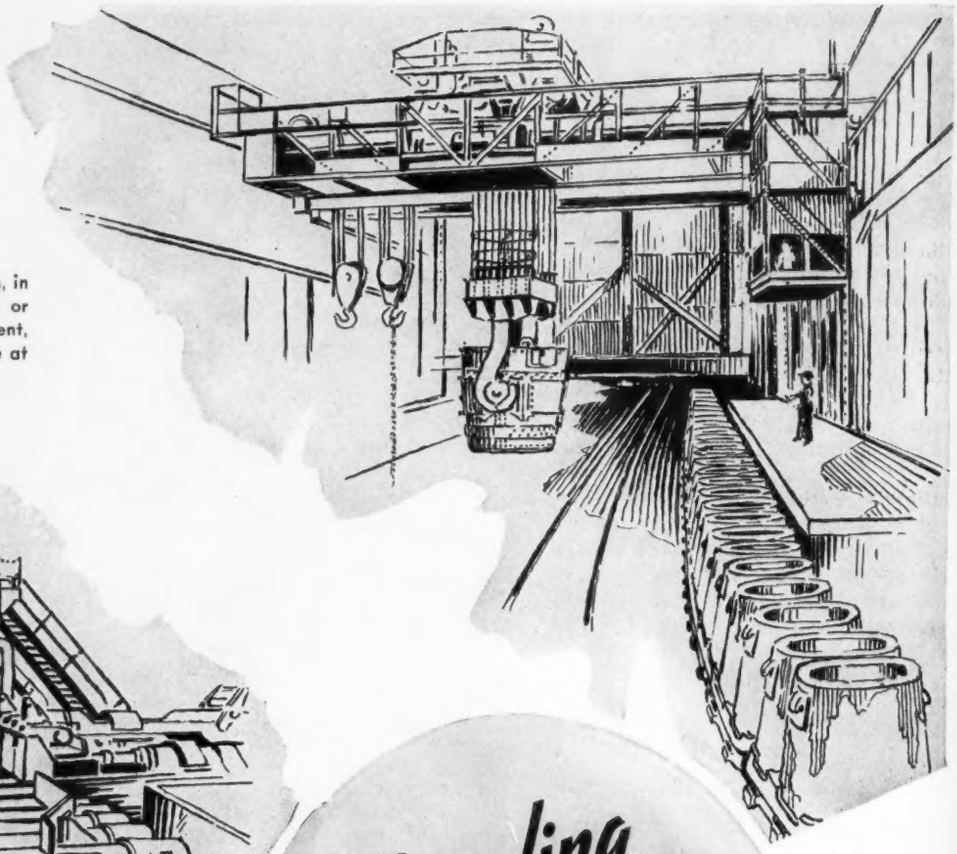
Apollo Steel Co., Apollo, Pa., is conducting an intensive study of steel houses and marketing possibilities. Shortly before the death of Joseph Patterson, Pittsburgh inventor, Apollo Steel obtained an interest in his plans for such houses.

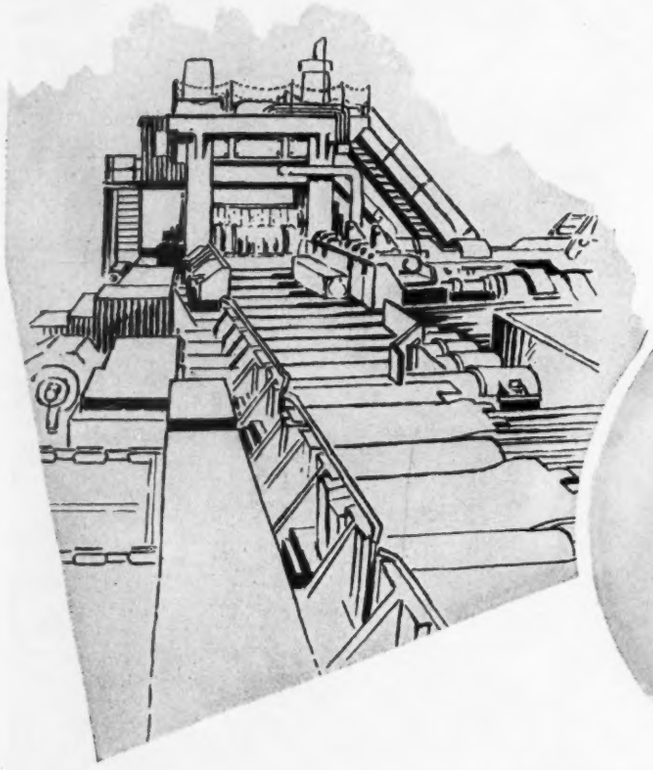
"The steel house looks like a very good thing," said A. M. Oppenheimer, president, Apollo Steel. "We think we can build them at very low cost as houses for workingmen. The cost of fabricating and erecting is the problem. The steel is the least part. In the ordinary small house, for example, only three or four tons of steel are needed."

A sample house may be opened soon, according to Mr. Oppenheimer.



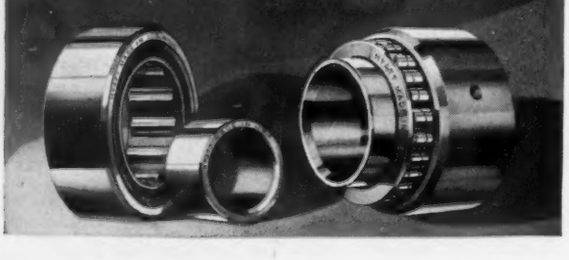
If you have any bearing problem, in the machines you manufacture or in your own operating equipment, Hyatt plant and field forces are at your disposal.





Speeding
PRODUCTION TOWARDS NEW ECONOMIES

HYATT
ROLLER BEARINGS



TODAY'S insistent demand for dependability in modern steel mill equipment is capably met by the indisputable advantages of fine workmanship and fine materials that identify every Hyatt Roller Bearing.

Built of the strongest bearing steel it is possible to procure . . . machined to microscopic tolerances which bring precision to the highest possible degree . . . every Hyatt has the exceptional ability to assimilate the gruelling punishment imposed by heavy loads and high speeds, while maintaining a constant and correct alignment of related parts.

Used in tables, cranes, motors, cars or other auxiliary equipment, Hyatts offer almost limitless possibility for economy in design and operation. Hyatt Bearings Division, General Motors Corporation, Newark, Detroit, San Francisco. Hyatt Roller Bearing Sales Company, Chicago and Pittsburgh.

MIRRORS OF MOTORDOM

DETROIT

TAKING the bit in its teeth, the motor industry last week began a determined push to work off heavy backlogs of unfilled orders. April is customarily a banner month for car production and the next two weeks should see a new high established since 1929, some estimates going as high as 550,000 cars. Every effort is being made to knock out the 300,000-car dent made in first quarter production by sitdown strikes.

Chrysler plants were back on their feet in practically no time after settlement of a 30-day strike. As early as Monday 3700 cars dropped off assembly lines and large numbers of finished cars in storage started to move to dealers. Later in the week, production was approaching the pre-strike level of 26,000 cars per week, estimated total for the week being 22,200. Thus it is apparent little plant damage was suffered from boarders who took over the property from March 8 to April 7.

At Hudson the picture was a little different, and more delay was encountered in restoring operations. By this week, however, it is believed production will be resumed. Retail sales of Hudson-Terraplane for March were the best for that month in seven years, totaling over 12,000. This represents a gain of 37 per cent over February and indicates dealers' stocks were in good shape despite interruption to production.

Hay While Sun Shines

So the industry finds itself virtually strike-free for the first time since the middle of last November and is preparing to make the most of the situation, although fingers generally are crossed, especially in view of the Supreme Court decision on the Wagner Act.

As far as the Wagner Act and the leading car builders are concerned, little effect is anticipated, since most producers already have signed agreements giving collective bargaining rights. Ford, however, remains the enigma in the situation, but at present the UAW does not have the remotest chance of being able to invoke the principles of the act, since its membership at Ford is confined to a handful of recently hired employes.

Last week the UAW had readied an airplane equipped with a voice amplifier to fly over the Rouge plant for a sales talk to Ford employes on the UAW. First flight was postponed because of bad weather. The question is now: Will Ford exercise his air rights and police the ozone above his plants as he polices the plants themselves?

A representative in the Michigan legislature has suggested Ford employes form their own union independent from company sponsorship, then call an election under the labor board auspices, and avoid any CIO entanglements. There appears to be no reason why this would not work, unless it be lack of leadership for such a group.

Eyes on Dearborn

Henry Ford is still hinting at a radical change in hours and wages "as soon as this strike mess is settled." Exactly what it will be no one can say as yet, but in view of the large numbers of men which the Ford employment office has been lining up for jobs recently, the change likely will include both a reduction in hours and increase in rates more than sufficient to make up for the shorter day.

Complexion of the Rouge plant continues to be dolled up, latest improvement being the completion of two new coke oven batteries and a fuel gas distribution system to handle the increased gas production of 8,000,000 cubic feet daily. Mr. Ford personally placed an order with Gerard Swope of General Electric the other day for a $5,000,000 turbogenerator which will add 150,000 horsepower to capacity of the Rouge power house. Add to this the recently reported plan to enlarge steelmaking capacity, and a large new tool and die shop, and you can see how Ford is moving toward demonstrating what he terms "some real competition in quantity production."

If Ford is not demonstrating this competition currently, then it is something closely akin to it, with the week's production sailing along on even keel at 34,850 units, including 850 Lincoln Zephyrs.

As an index of the relative demand for the two present types of Ford models—one with the 60-horsepower and the other with the 85 horsepower motor—engine assemblies are now running at a rate of about 450 per hour, with 150 of these the 60's. Thus about one third of current Ford sales are for the light model which shows considerably improved gasoline economy for city driving.

Sitdowners Stand Up

Wednesday afternoon 120 sitdowners at Yale & Towne Mfg. Co., including 79 women, were driven from the building and arrested after a furious battle with police and sheriff's deputies using teargas and nightsticks. Strikers were holding the plant in defiance of an eviction order. After the melee five UAW organizers also were taken into custody when one of them made open threats against Police Commissioner Heinrich.

Swarms of UAW sympathizers gathered about the neighboorhood and were being incited to action by a union sound truck. Police promptly confiscated the truck and removed it to the pound.

A score of persons were injured in the eviction, including a number of police who were struck by small castings thrown from the roof of the plant. Police claimed the fighting started after three shots were fired by someone inside the plant.

Yale & Towne makes locks for Chrysler, and sitdowners had been on strike since March 8, after the UAW had stepped in to organize the workers following formation of a company union.

Sitdown strikes began Wednesday at Koestlin Tool & Die Corp. and at Richard Bros. Die Works, indicating

MIRRORS OF MOTORDOM

attempts of the UAW to bore into the tool and die shops here have been partially successful. Two other unions, the MESA and the Society of Tool and Die Craftsmen, are active in the die shops, and prospects of interunion warfare are becoming more imminent, just on the verge of the busy season for these plants.

IN CANADA, where 3700 General Motors workers are idle at Oshawa as a result of a strike engineered by the UAW, the situation was growing critical following the resignation of two Ontario cabinet ministers, who disagreed with the policies of Premier Mitchell Hepburn. The Premier is strong in his denunciation of the CIO movement, but against this attitude is the belligerent Alex Hall, mayor of Oshawa, who called on the UAW to order strikes in all American General Motors plants in sympathy with the Canadian walkout.

Although UAW officials threatened to do this, it appears doubtful they will proceed with anything as rash as this, especially in view of the 44 days of wages General Motors employes already have lost this year.

Serious as the situation is, it is still amusing to some Detroit executives who were approached recently by representatives of Canadian cities urging them to establish plants in Canada to be rid of strike troubles. Although it is true several minor sitdowns were dealt with summarily in Canada, this first major tieup already has brought a tempest to government circles. General Motors production at Oshawa averages 500 cars daily, bulk of them Chevrolets.

Insurance companies in Hartford, Conn., have received the pleasant news of claims filed against them by automobile plants afflicted with sitdown strikes. Approximate claims are: Reo, $100,000; General Motors, $250,000; Hudson, $150,000, and Chrysler, $200,000. The claims were filed under riot and civil commotion clauses in policies, but it is understood the Factory Insurance association, organization of insurance companies, has refused to pay claims of "indirect" damage as a result of sitdowns.

BUSINESSMEN here were studying with more than passing interest an article in a current issue of a national magazine entitled, "Revolution in Michigan," and reported to be the true story behind the GM strike. It confirmed and elaborated on many of the connections between the CIO and communist and socialist leaders mentioned previously in these columns. It observed significantly that the present trend of sitdown strikes paves the way to a violent reaction on the part of the public, and the possible advent of a form of fascism.

Already several type of "vigilante" movements on the part of citizens have been instigated. Many will recall the recent Flint Alliance which proposed to clean up that city in the name of law and order. The Citizens of Michigan group is now deluging its headquarters with petitions urging a firmer stand by the governor. Reports are heard of a third group, called We Americans, which is said to have held a meeting here to draw up plans for crystallizing public opinion against sitdown strikes.

The American Legion lately has been distributing lapel buttons inscribed, "Law and Order" among people in this territory, and is active in a drive against the communist element in union organizations.

Automobile Production

Passenger Cars and Trucks—United States and Canada
By Department of Commerce

	1935	1936	1937
Jan.	300,335	377,306	399,426
Feb.	350,346	300,874	383,637
2 Mos.	650,681	678,180	783,063
March	447,894	438,992	*490,000
April	477,059	527,726	.....
May	381,809	480,571	.....
June	372,085	469,355	.....
July	345,297	451,474	.....
Aug.	245,075	275,951	.....
Sept.	92,728	139,785	.....
Oct.	280,316	229,989	.....
Nov.	408,550	405,702	.....
Dec.	418,317	519,132	.....
Year	4,119,811	4,616,857	.....

*Estimated.

Calculated by *Cram's Reports*

Week ended:

March 20	99,013
March 27	101,046
April 3	97,005
April 10	†97,910
April 17	124,970

†Revised.

	Week ending April 17	April 10
General Motors	52,155	50,080
Ford	34,850	34,850
Chrysler	22,200	.....
Independents	15,765	12,980

LARGE equipment buying program which Chrysler has up for a new Canadian engine plant has been held up temporarily until figures can be assembled on the cost of used machinery for the project. Chrysler executives are studying the possibility of saving a considerable amount by this means and at the same time making use of some of the used machinery now available in Chrysler plants.

While it is questionable how much of the latter could be pressed into service satisfactorily, the fact that orders for new machinery are in many cases carrying a clause relative to prices being subject to an increase of anywhere from 12½ to 20 per cent depending on how far ahead deliveries will be, is giving buyers the jitters over proceeding with extensive programs of re-equipping. Deliveries of standard machine tools range from 12 to 18 weeks, while some special equipment is noted on the basis of up to 26 or 28 weeks.

AMICABLE adjustment of the fight for control of Reo has been adjusted by an agreement between D. E. Bates, president of the company, and Frank A. Vanderlip Jr., New York financier, who had previously formed an independent stockholders' committee to round up proxies for his interests. The Reo board of directors will be increased from five to nine members and will include Mr. Vanderlip, Herbert W. Smith of Union Carbide, two others to be elected this week, and the present board.

Mr. Vanderlip's associates are seeking to persuade Reo to re-enter the passenger car field with a new model they have promoted. It is of the ultra streamline type, arranged so the engine car be installed either front or rear according to the buyer's wishes. A market for 40,000 cars annually is seen. Being given representation on the board, Mr. Vanderlip has abandoned his plans to "renovate and stimulate" the company, but it is likely more will be heard of his new type passenger car in the near future.

Reo abandoned production of passenger cars a little over a year ago, following collapse of a co-operative arrangement with another company on body dies. Currently the company is building about 1000 trucks and commercial cars monthly, and production has just been resumed after a three-week strike. Unfilled orders now on hand are claimed to be at a record high.

WINDOWS OF WASHINGTON

WASHINGTON

OPINION here, following the Supreme Court's decisions on the national labor relations act is that industry is responsible for everything and labor for nothing. Under this law about the only responsibility of labor is when a laborer faces a court under oath, he has to tell the truth. Otherwise he is as free as the wind. There are those in Washington, and New Dealers among them, who agree that something will have to be done about this—in other words labor and labor organizations will have to have some responsibility in the future.

There are so many collateral issues to the court's decisions that it will take time to find out what they all are and just what the decisions really do to them.

For one thing it is quite apparent that the labor board's case against the Carnegie-Illinois Steel Corp. is finished. Of course this case was practically closed before the decisions were rendered, due to the agreement reached between the steel company and the CIO. However, the CIO has never yet formally withdrawn its complaint and until that is done the board will not clear it from the docket. However, it is a foregone conclusion that the corporation's lawyers would not go ahead with this case in the face of the decisions of last Monday.

Expect Sentiment to Turn

One of the things being discussed on Capitol hill is that company unions are just about out of the picture. While there was nothing specific on this point in any of the decisions there was such a strong inference to this effect that it cannot be ignored.

In connection with the responsibility of labor, many thinking people here, New Dealers and others, seem to be of the opinion that the labor pendulum has swung about as far as it can and that any action now will be toward industry and this applies to some of the labor legislation that is bound to be passed sooner or later by this session of Congress.

Many statements have been made by labor and other leaders since the decisions came down Monday but it remained for Secretary of Commerce Roper to call attention to the fact in his press conference that "we must keep in mind the necessity of providing for co-operative approaches in the handling of human relations, which means that both employer and employe should be provided with instrumentalities for equal consideration." In this connection it is understood that the secretary meant that in his opinion some obligations must be placed on the side of labor as well as on the employer.

NLRB Gains Prestige

Further, in connection with its effect on business, Mr. Roper said: "I feel that any decision, whether in the court room or between the employer and employe in industry, that eliminates doubtful and contentious features, is in the interest of stabilization of attitude. What is needed in this country today is a stabilization which results from understanding and from an attitude and disposition to co-operate in working out mutual problems. Therefore, I feel that this decision is in the interest of more harmonious industrial relations and therefore of improved business."

Of the many features which come up as the result of the court's action, the status of the national labor relations board has to be considered. That board has never been of importance to this time—but from now on it will be of major importance.

In this connection the attitude of J. Warren Madden, the chairman, has to be considered. He absolutely dominates the other two members of the board and he is certainly pro labor, to put it mildly. During the course of hearings held before the board it has been noted that whenever an industrial lawyer asks to put in an exhibit, to cross question or to take any other action that might be detrimental to the labor side of the case, he is refused by the chairman. In other words the industrialist never up to this time has had a fair hearing before this board with Madden in the chair. This is something to be reckoned with.

At his press conference last week immediately following handing down of these decisions, the President refused to make any comments for publication. He stated at that time that he had only read the opinions hastily and therefore needed more time for their study. However, he raised the question with visitors who talked with him on this subject as to whether these decisions dealt only with the specified cases involved or whether they would be an absolute precedent for the future. Further, do they apply, he questioned, to collective bargaining only or to child labor, hours and wages as well.

When the decisions were first announced there was a general feeling that they meant death of the president's court reform plan. However, the very opposite is the feeling now, especially in view of statements made at the recent press conference in which it was fair to infer not only from what the President actually said but how he said it, that he will push ahead on his court plan.

Labor Conference Called

At any rate one thing is certain and that is that it will be some time before the full significance of these decisions will be known. Legislators and lawyers, both labor and industrial, many of whom have been in Washington for years, all seem to put different interpretations on the decisions.

As the direct result of the court's action President Green of the A. F. of L. has called a meeting of his executive council for April 19 and Secretary Perkins has called a conference for the following day.

Myron C. Taylor, chairman, United States Steel Corp., and several other industrialists have been invit-

ed to the Perkins conference, with representatives of labor. This conference is slated to discuss collective bargaining and labor legislation. There seems to be some conflict between Madam Perkins on the one hand talking of collective bargaining and the labor board on the other which is charged by law with this subject. That is just another matter that has not yet been straightened out by the New Deal. It is rather interesting to note this, in view of the fact that Miss Perkins fought tooth and nail when the labor board legislation was pending in congress to have it put under her jurisdiction. That was decided against by Congress but still she takes a leading part in some of the board's activities.

ANOTHER SCRAP EXPORT BILL

A bill (H.R. 6278) in all ways comparable to the Schwellenbach bill in the senate has been introduced in the house by Representative Kopplemann, Connecticut, which would prevent export of iron and steel scrap except through export licenses issued by the President.

Kopplemann's office states that his bill was not introduced at the request of any of his constituents but simply because of his interest in the subject of neutrality. Strangely enough the congressman is a member of none of the committees of the house dealing with this subject, his sole committee being banking and currency. It is understood that he will revise his bill at a later date, but in what way it will be revised cannot be determined at this time.

HOUR-WAGE BILL DRAWN

The draft of a proposed administration bill dealing with hours and wages but which some choose to call a new NRA bill is being studied by the justice department and a report on it will be made to the President in the very near future, it became known last week.

Although there have been statements from time to time that such a bill or bills had been drawn up, it was confirmed only last week by a witness appearing before the senate judiciary committee in connection with the President's judicial reform bill. Siegfried Hartman, a New York lawyer, drew up such a bill for Major George L. Berry, and the latter submitted it to the President and he in turn asked for an opinion from the department of justice. Hartman claimed that the bill gets around all of the objections of the Supreme Court made in the NRA decision outlawing the act.

Hartman referred to the bill he had drawn up as "bombproof as to constitutionality." During his testimony he referred to this NRA bill and said that it gets around both the "due process" and "interstate commerce" clauses of the Constitution. This is just one of the many bills that have been drawn for the President and which he is said to be studying for future use.

SOIL PIPE CASE A FEELER ON BASING POINT

There is every evidence here that the federal trade commission has brought its complaint against the cast iron soil pipe industry as a feeler. If the commission can go through with this Birmingham plus case, it is entirely possible that it will go ahead on the basing point system used generally in the steel industry.

Some officials of the trade commission feel that there is no difference between a single basing point as used by the pipe people and the multiple basing point system as used by the steel industry. The principle, they say, is the same.

The complaint against the pipe industry was brought under both the trade commission act and the Robinson-Patman act and it is to be assumed that if such a complaint were brought against the steel industry, or any branch of it, that the procedure would be practically the same.

Of course, according to the routine of the trade commission's work, it will be some time before the pipe case is settled, particularly if the latter go to the courts on an appeal. There seems to be an idea in the minds of some officials of the commission that the steel industry will back the pipe people in their fight in this case to save themselves trouble later. There is no secret, naturally, about the attitude of the trade commission and apparently all of its officials in connection with the basing point system used in the steel industry.

COLLUSIVE BIDDING PROBE PROBABLY TO BE DROPPED

There is a chance that Donald Richberg, erstwhile head of NRA, will come to the rescue of the steel industry for a second time in as many years. Last year he made the strongest case for the steel industry before the Wheeler committee of the senate when it was having hearings on the basing point system in connection with the Wheeler anti-basing point bill. He made a splendid witness for the industry then because he believes in the basing point system, which he has stated on many occasions, publicly and privately.

Last week the President let the cat out of the bag at a press conference when he stated that Richberg had conferred with him in connection with the collusive steel bidding investigation. There is every reason to believe that Richberg has not changed his mind regarding the basing point system and if he has not perhaps he has shown the President a side of the picture that the latter had not been familiar with.

The whole basing point question is likely to come to the front in the next few weeks, due to statements made by the President and the attorney general to the effect that a report on collusive bidding on steel for the PWA is to be made within the next two or three weeks by the department of justice.

There are indications here that there will be no prosecutions in this case. This is based only on the attitude of the attorney general at recent press conferences in which he has pointed out to the newsmen how practically impossible it is to get a conviction from the courts these days in Sherman antitrust law cases.

The belief there will be no prosecutions is based not only on what the attorney general has said but his apparent attitude in making such statements. He has really gone out of his way to explain how hard it is to get convictions. The idea here is that while the department may have uncovered what it considers some damaging evidence that this is not considered sufficient by the department's experts to carry conviction in the courts.

WOULD ASSURE TIN SUPPLY

Last week Representative McReynolds, Tennessee, introduced a bill (H.R. 6322) in the house "to provide for the co-operation between the United States and foreign nations producing tin ore and other materials to assure to the United States continuing supplies of the same to supplement deficient domestic resources and production." The bill has been referred to the house committee on foreign affairs.

AMEND WALSH-HEALEY LAW

Senator Walsh and Representative Healey, both of Massachusetts, last week introduced a bill in both houses proposing amendments to the Walsh-Healey act. The new bill is designed to reinforce and clarify the basic labor principles of the original act. It would make the law apply to purchases of $2500 instead of $10,000 and place bidders on an ineligible list for persistently violating the labor relations act. It also would amend certain administrative difficulties which have developed. Wage, hour and child labor provisions would remain the same as at present. would remain the same as they are at present.

Editorial

Is Wagner Act a Law, or Another "Scrap of Paper"?

IN THE few days which have elapsed since the Supreme Court ruled the Wagner act constitutional thousands of commentators have expressed their views of the decision with only few them having given more than cursory thought to its effect upon the fortunes of the two principals involved—employers and employes.

It is true that Senator Wagner, numerous politicians, many new dealers and scores of columnists and editorial writers for newspapers have touched upon the potentialities of the act for "promoting industrial peace," facilitating the process of true "collective bargaining," ending the "reign of oppression" of workers by the "bosses," etc. But it is doubtful whether any of these observers have been primarily concerned with the real effect of the law upon the average industrial employe or his employer.

To satisfy your curiosity on this point, reread some of the statements issued shortly after the decisions were announced. You will note that the majority of editorial writers were interested more deeply in the possible political effects of the verdict than in its influence upon labor relations. Scores debated its effect upon the President's court packing plan.

Highly Touted Magna Charta May Turn Out To Be Retarding Influence for Labor Movement

Professional labor's spokesmen waxed eloquent upon the "great victory" which the decision represents for the labor movement." Examined closely, most of the exultation thus expressed did not emanate from a feeling that the American industrial employe had won a victory, but that the "movement," or rather John Lewis and his motley assortment of leftist and rightist camp followers, had been declared victors by five of the nine jurists.

Again, another great sector of commentators expressed elation on the ground that the court had cast aside its reactionary role, had taken unto itself the humanitarian viewpoint of the new deal, and, in short, had attuned itself to the modern conception of social justice. Most of these persons were not concerned with the justice or injustice of the act itself. Instead they were thinking of the great impetus this decision gave to the new deal's social philosophy, or of the political strength it imparted to the new deal party, or to the terrific jolt it dealt to the economic royalists and princes of privilege.

And so, what we witnessed last week was not the wholesome, solid satisfaction of a thinking nation over a job performed superbly but rather it was the almost hysterical applause of an unthinking, high strung, emotional audience which was engrossed so deeply in the technique of the actors and in the spectacle of the stage settings that the significance of the play itself escaped them.

At some future time the nation will awake to the cold reality that the Wagner act, far from being the highly touted Magna Charta of labor, is in truth the halter leading to labor's ultimate subjugation by government. Years from now, labor leaders and politicians will curse the cruel turn of fate which prompted a Lewis and a Roosevelt to perpetrate such a one-sided law that the nation in righteous rebellion against its unfairness enacted corrective legislation which set back the labor movement a decade or two.

Industry's employers and employes need not be concerned with the effect of the decision upon politicians nor upon the persons who collect union dues. Industry's immediate interest is in the new status of labor relations.

Wagner Act—Discriminatory As It Is—If Enforced, Would Be Preferable To Recent Anarchy

Off-hand, it may be hoped that an enforced Wagner act—one-sided as it is—will be preferable to the anarchy which has prevailed in some sectors of the labor front. If the President, the various governors and the local authorities could be induced to enforce the law as it is written in the Wagner act, they could put an immediate stop to the strikes which are caused by the whims of a meager minority of irresponsible hoodlums.

Much will depend upon the sort of leadership exercised by public officials and by labor leaders. If President Roosevelt continues to condone, if not actually encourage lawlessness, and if Mr. Lewis continues to permit thugs, communists and graft-seeking gangsters to operate under the cloak of CIO, then the Wagner act will become as much a scrap of paper as the notorious broken treaties of Germany and the flagrantly disregarded laws of Michigan and Minnesota.

The President recently has suggested reviving a form of NRA to afford employers "protection" to somewhat balance that accorded labor through the Wagner act. We believe that industry generally and the decent element of the public will consider the enforcement of existing laws more important than the writing of additional "scraps of paper."

STEEL'S INDEX OF ACTIVITY
In Iron, Steel and Metal working Industries
Based upon freight car loadings, electric power output, automobile assemblies (Cram's Reports) and steelworks operating rate (STEEL). Average for 1926 equals 100, weighted as follows: Steel rate 40, and carloadings, power output and auto assemblies each 20
Per Cent
1937
1936
STEEL
1929 1930 1931 1932 1933 1934 1935
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

STEEL'S index of activity gained 0.5 points to 112.5 in the week ending April 10:

Week ending	1937	1936	1935	1934	1933	1932	1931	1930
Feb. 27	112.8	83.4	81.1	76.8	47.4	55.1	75.8	99.7
March 6	117.9	87.7	82.0	78.6	43.4	54.1	79.2	93.8
March 13	112.7	89.7	84.0	79.9	42.7	54.8	80.6	97.5
March 20	113.1	86.0	84.0	79.7	44.6	54.4	81.3	98.1
March 27	114.0	91.2	84.3	79.3	45.2	53.5	80.6	99.6
April 3	112.0†	86.8	83.4	79.6	49.1	53.4	81.5	97.6
April 10	112.5*	99.6	85.4	82.2	52.6	52.6	80.9	102.3

*Preliminary. †Revised.

Business Reflects Stability in Face of Disturbing Factors

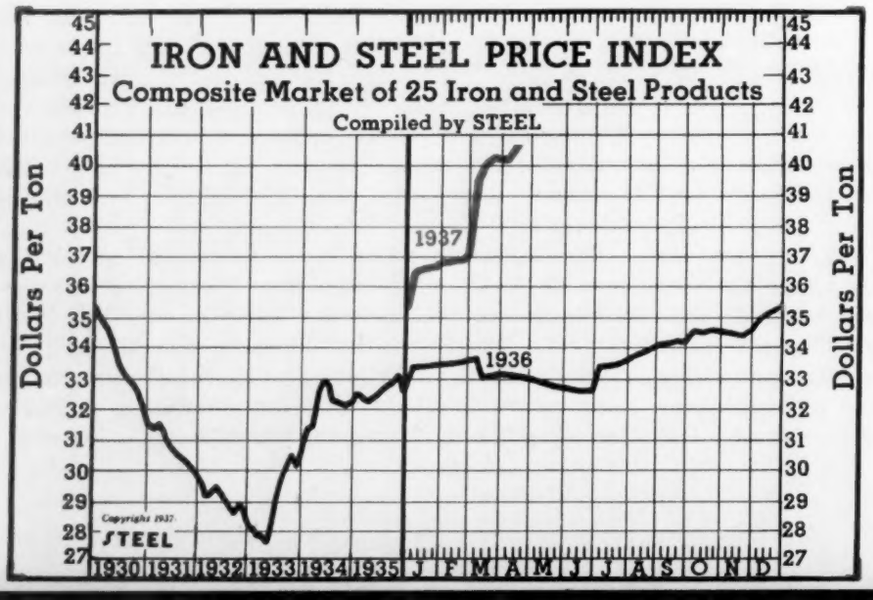
CONSIDERING the rough nature of the political and economic weather of the past two months the ship of business has demonstrated that it is a seaworthy craft. Crisis after crisis has been met and passed in European affairs. Labor discord and near anarchy have prevailed at home. At times several hundred thousand workers have been idle on account of strikes. Yet in spite of these serious factors, industrial activity has been maintained at a steady rate.

STEEL'S index in the eight weeks from the week ending Feb. 20 to that ending Apr. 10, inclusive, has remained within a comparatively narrow range, except for the first week of March when a short-lived breathing spell in the discord in motordom permitted automobile output to jump upward sharply. Except for this one instance, the index has fluctuated between a low of 109 and a high of 114. In the latest week under review, that ending Apr. 10, the index stood at 112.5, a slight gain over the 112.0 in the previous week.

Harmony in the automobile industry and the likelihood of a peaceful settlement of international difficulties abroad may have a strong bearing upon the trend of business in the remainder of the second quarter. Automobile output and freight car loadings should increase during the remaining weeks of April. Steelworks operations should remain around current levels through most of the quarter.

Easing of the tension abroad probably would curtail, and probably already has to some extent, the speculative element in the demand for materials for armament.

At home attention has shifted from commodity prices to the government financial situation. A tighter rein upon public expenditures may be an early development.


IRON AND STEEL PRICE INDEX
Composite Market of 25 Iron and Steel Products
Compiled by STEEL
Dollars Per Ton
1937
1936
Copyright 1937
STEEL
1930 1931 1932 1933 1934 1935 J F M A M J J A S O N D

	1937	1936	1935
April 10	$40.55	$33.11	$32.27
April 3	40.19	33.13	32.27
March 27	40.11	33.13	32.30
March 20	40.10	33.05	32.33
March 13	39.99	33.04	32.38
March 6	39.47	33.60	32.39
Feb. 27	36.95	33.59	32.42
Feb. 20	36.71	33.54	32.50
Feb. 13	36.67	33.45	32.54

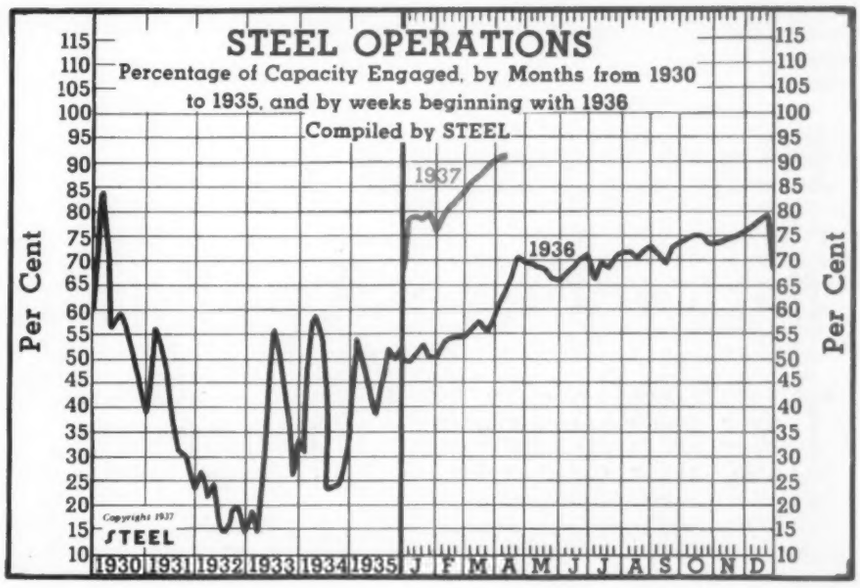
BUSINESS TREND

March Ingot Production Continues Upward

	Gross Tons		
	1937	1936	1935
Jan.	182,181	112,813	106,302
Feb.	184,361	118,577	115,595
March	193,683	128,576	110,204
April	.....	151,625	101,562
May	.....	155,625	97,543
June	.....	153,263	90,347
July	.....	150,874	87,224
Aug.	.....	161,351	107,997
Sept.	.....	160,043	113,000
Oct.	.....	168,333	116,398
Nov.	.....	173,496	121,170
Dec.	.....	170,448	122,936

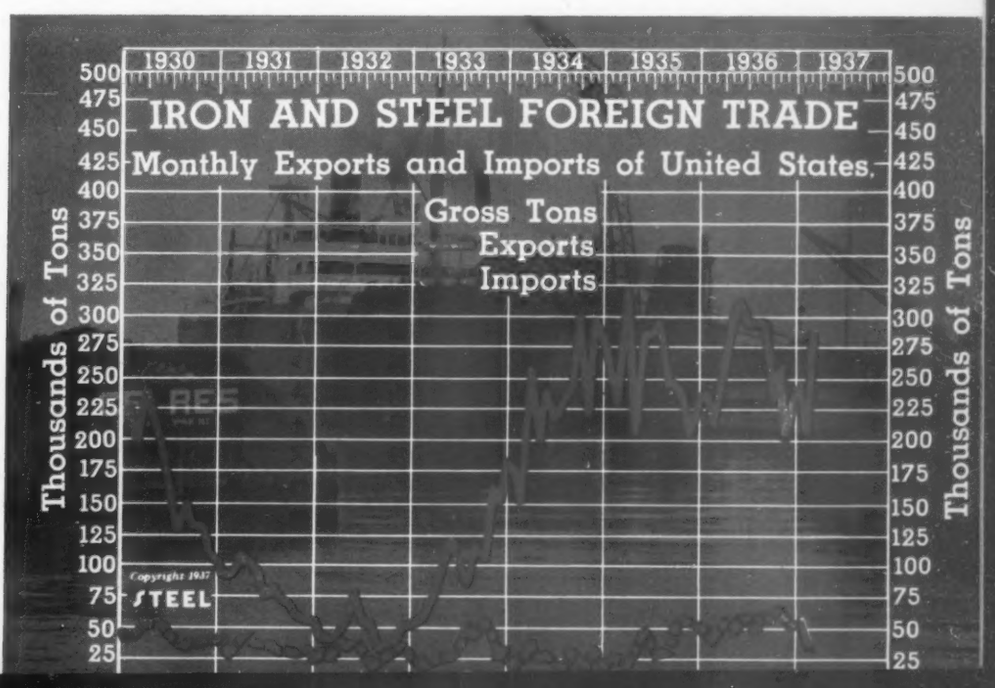
Steel Operations Hold At 91.5 Per Cent

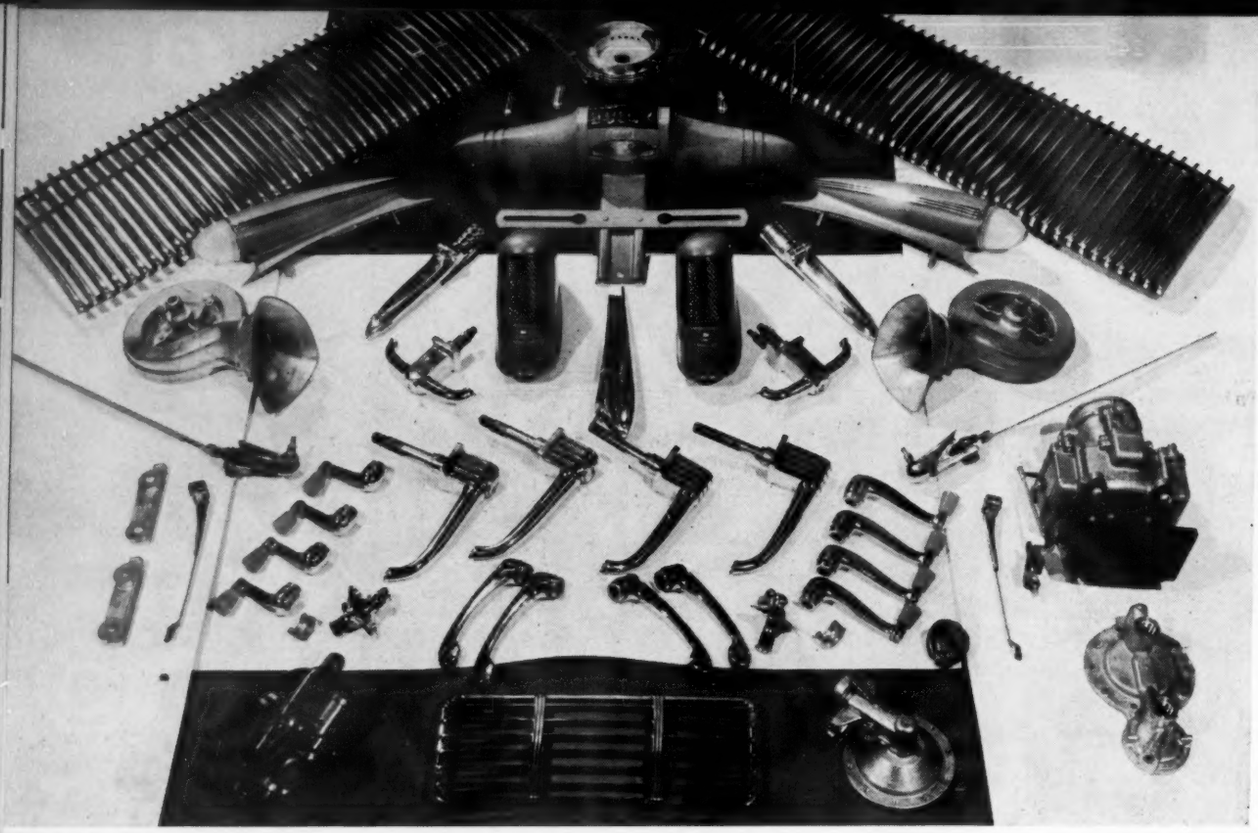
	Per Cent		
	1937	1936	1935
April 10	91.5	66.5	45
April 3	91.5	63.5	44
March 27	90	58.5	45
March 20	89	50	46
March 13	87	57.5	48
March 6	86	55.5	50
Feb. 27	84	54.5	48
Feb. 20	83	54.5	50
Feb. 13	81	54.5	53
Feb. 6	79.5	53	54.5


STEEL OPERATIONS
Percentage of Capacity Engaged, by Months from 1930 to 1935, and by weeks beginning with 1936
Compiled by STEEL
1937
1936
Per Cent
115 110 105 100 95 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10
Copyright 1937 STEEL
1930 1931 1932 1933 1934 1935 J F M A M J J A S O N D

Steel Exports Register Sharp Gain in February

	Gross Tons			
	1937		1936	
	Imports	Exports	Imports	Exports
Jan.	43,063	201,511	50,489	241,564
Feb.	41,628	290,987	43,358	213,802
March	.....	.....	56,720	264,337
April	.....	.....	49,621	301,987
May	.....	.....	59,391	314,950
June	.....	.....	59,910	294,951
July	.....	.....	47,940	296,738
Aug.	.....	.....	60,697	295,341
Sept.	.....	.....	59,993	235,571
Oct.	.....	.....	64,509	261,882
Nov.	.....	.....	61,970	203,297
Dec.	.....	.....	52,584	244,156


IRON AND STEEL FOREIGN TRADE
Monthly Exports and Imports of United States.
Gross Tons
Exports
Imports
1930 1931 1932 1933 1934 1935 1936 1937
Thousands of Tons
500 475 450 425 400 375 350 325 300 275 250 225 200 175 150 125 100 75 50 25
Copyright 1937 STEEL



MORE than fifty die cast parts or assemblies are used in the 1937 Buick

Die Castings in Automotive Applications

BY C. R. MAXON

THAT die castings possess utility for a wide range of automotive parts is too well recognized to require emphasis here. Among the chief reasons for their extensive use are:

1—Adaptability to rapid production at moderate cost and within closer dimensional limits, not only as compared to other castings, but also as against stampings and forgings.

2—Adaptability to a wide range of shapes and sizes, including complex parts with difficult core work.—Irregular contours and structural elements which, though not so strong, of course, as wrought parts, have unusual toughness (high impact strength) as compared to most low-cost castings.

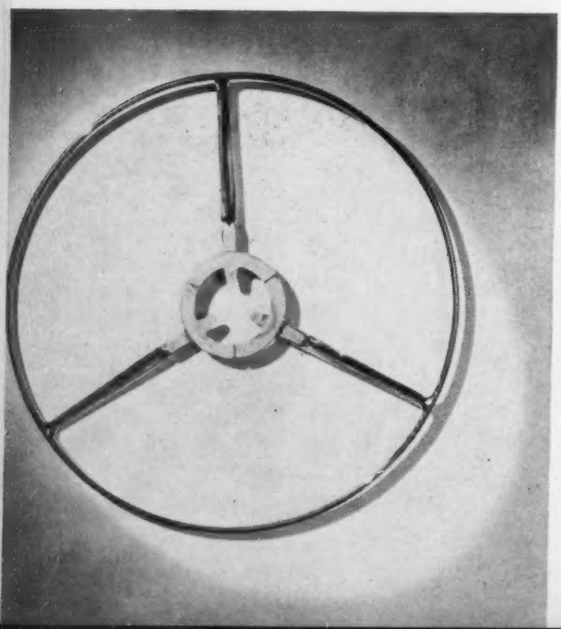
3—Producibility in some instances with surfaces so smooth as to require little or no polishing or even buffing prior to plating or other applied finishes.

4—Producibility in remarkably thin sections, yet with a stiffness not attained, as a rule, with stamped parts,—and often with the metal disposed (as in bosses and ribs) in a manner not feasible in stamping and forging.

5—Relative ease of machining, when machining is required, and with a minimum waste in metal removal.

6—Comparative resistance to corrosion under most conditions of service, such corrosion as does occur being confined to the surface and rarely affecting the strength or serviceability of the part.

HORN ring for Buick steering wheel is cast in one piece and afterward cut apart at the central ring



There are, of course, many other reasons for the use of die castings, as will appear in the discussion of specific applications hereafter. There are also certain limitations which must be observed, as with other castings and indeed with all automotive materials. It is well to remember, however, that the utility of the die casting is far from being confined to decorative parts. Many structural elements are used, as later shown, and there is likelihood of further developments along this line.

Other papers presented before the society have gone quite fully into the die casting alloys available. The properties are covered in detail in the booklet, "Zamak Alloys for Zinc Alloy Die Castings." Hence it is not necessary to detail this phase of die castings here. Zinc alloys ac-

count for over 95 per cent of automotive die castings and hence are considered almost exclusively here. Some die castings based on aluminum, copper, magnesium, lead and tin, are or have been used chiefly for rather special applications in the automotive field.

Besides the low cost of the zinc alloys themselves, factors in their favor include: (a) generally excellent physical properties; (b) low die cost, because the metal casts at low temperature and dies do not require heat-treatment. Because of these advantages, some die casters employ zinc alloys exclusively and almost all servng the automotive industry confine all or nearly all their automotive production to zinc alloys.

Limitations Listed

Limitations of zinc alloys include those involving temperature in service. Prolonged use at temperatures above 300 degrees Fahr. is not recommended. Impact strength is high, as already indicated, under normal temperatures, but decreases rapidly at very low temperatures, although the impact strength is regained with the return to normal temperatures. Despite this fact, breakage attributable to it is rarely reported. It should be kept in mind by designers, however, and an adequate factor of safety allowed, especially with structural parts. With S.A.E. No. 921, containing 2.7 per cent copper, the high initial impact strength is reduced to about one-third this value by three years of normal aging in service. The No. 903 alloy, which is copper free and now very widely used, has equally high initial impact strength but does not decrease under any aging condition, although it is temporarily reduced by low temperature, as already indicated.

A somewhat newer alloy, No. 925, has been recently adopted by S.A.E. It is the equal of No. 903 in permanence of dimensions and impact strength, while at elevated temperatures, growth of dimensions and loss of impact strength are of lesser magnitude and slower rate than No. 921. It may be used in virtually any application for which No. 921 is suited, and being somewhat more resistant to surface corrosion than No. 903, may be used when additional corrosion resistance beyond that of No. 903 is required or better permanence than can be obtained with No. 921.

The foregoing remarks apply, of course, to standard specification zinc alloys made from high purity (99.99+ per cent) zinc and in which the tin, lead and cadmium content is held rigidly below the maximum allowable limits. All reliable die casters adhere closely to standard specifications and many of them have recently installed modern spectrographic equipment for rigid checking. Alloys made to standard specifications are entirely free from the destructive intergranular corrosion which many years ago was encountered with die castings in which good alloying practice was not followed.

WIDE use of die cast parts by automotive manufacturers has created much interest in this subject. Mr. Maxon of the New Jersey Zinc Co. delivered this paper before the Detroit section, Society of Automotive Engineers recently. STEEL presents it in three sections of which this is the first. The remaining sections will appear in forthcoming issues

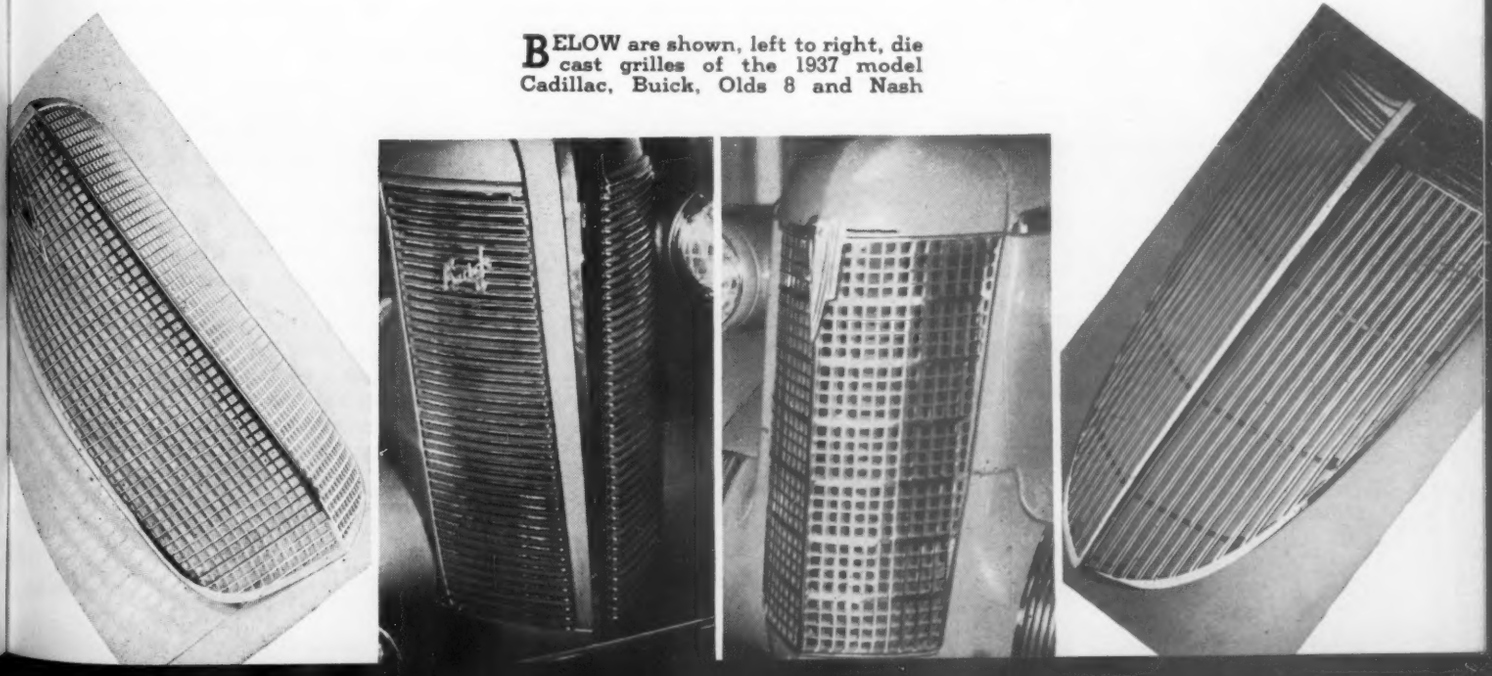
SECTIONAL construction is the most interesting feature of the Olds 6 grille. In case it is damaged, the broken sections may be replaced easily

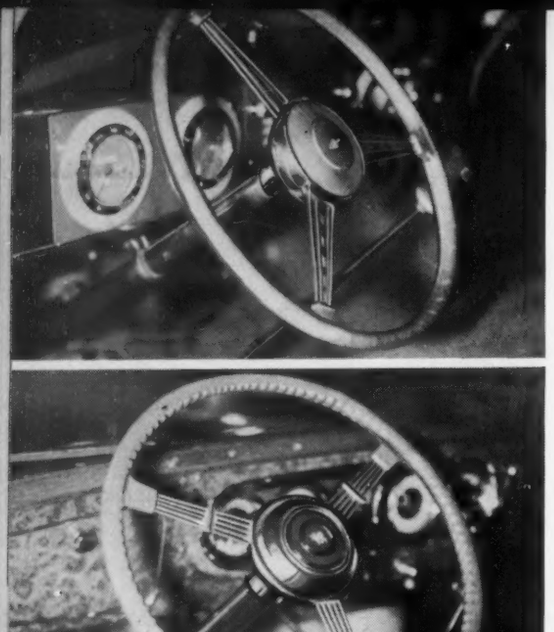
As with most metals, exposure to moisture, especially at elevated temperatures, tends to increase surface corrosion. Continuous or prolonged use in contact with hot water or steam is not recommended. Normal exposures in service of automotive zinc alloy die castings seldom result in corrosion difficulties, but when they may do so, as in occasional carburetor castings exposed to fuels containing water, a simple dipping treatment in a suitable solution affords adequate protection. This treatment, known as "Cronak," is patented by the New Jersey Zinc Co.

Applications of Die Castings

Just as "the proper study of mankind is man," so the proper study of die castings affords the best insight into their reason for being, and should help to bring out many facts helpful to designers and other engineers interested in future appli-

BELOW are shown, left to right, die cast grilles of the 1937 model Cadillac, Buick, Olds 8 and Nash





DIE CAST construction adds to the safety and appearance of modern deluxe spring-type steering wheels. Above are shown from top to bottom Olds, Packard and Buick wheels

cations. The following examples are selected either as being typical of good current or recent practice, or because they embody certain more or less "special" features deserving of consideration whenever new designs are up for discussion. In presenting these examples the author acknowledges indebtedness to many automotive and die casting engineers who have contributed liberally from their experience for the benefit of the S.A.E. and its members. Many of the comments made, however, are a result of the author's own rather extensive observations concerning die castings. It is his hope that those who disagree on any points raised will give frank expression to their views for the benefit of all concerned, in discussion of the paper.

It is inevitable in any paper that comparisons be made of various materials and fabricating methods. The writer has attempted to present competitive materials in as fair a light as possible.

Although grilles may be regarded as a somewhat special form of die casting, they are prominent because of their position on the car. They are die cast, in fact, quite largely because of their prominence and because it is important from a sales standpoint to have a grille of fine appearance. Since appearance is a matter of individual preference, and preferences differ, besides being influenced in some cases by commercial considerations, there is undoubtedly a difference of opinion as to whether die cast grilles are better looking than the stamped variety, but we think it is conceded that exceedingly fine appearance has been attained in the die cast grille. The author leans to the view that the die cast grille is invariably better in appearance as well as better in other respects than commercially feasible stamped types, though it is not always the cheapest, and perhaps never the lightest, construction. If this is correct, it may well be asked why fewer cars use the die cast form in 1937 than in 1936 models. Many factors enter into this consideration. One of the reasons for writing this paper is to answer this question, so far as feasible, and it would be interesting to secure in discussion the views of others on the mooted factors involved.

Expand Production Facilities

An important and perhaps the primary reason for dropping die cast grilles on some 1937 models was that production facilities were overtaxed in supplying some 1936 models, with consequent delays in deliveries. They were overtaxed largely because the number of die casting machines then available for making one-piece grilles was limited in proportion to the demand. Polishing and plating facilities were also heavily taxed.

Today there are much better machines available. Their number is not great, but they are simple and effective and more could be built if orders for 1938 grilles warrant, and they are placed early enough. The placing of orders at the eleventh hour multiplies difficulties. It is also likely to result in grilles which are both heavier and more expensive than they need be if proper forethought were given to the early placing of orders. A sufficient allowance of time should be made for the die caster to try out a die for thin sections before going to heavier ones, if they are needed, to get a good job. At least one grille in production today is, in the opinion of one of the most competent die casters, fully 20 per cent heavier than it need have been if he had been given a little more time to make and try out the die. Deliveries were required so soon after placing the order that sections had to be made such as he knew would work. Had more time been allowed he would have tried and probably succeeded with thinner sections, but there was no time to experiment. It is easier, comparatively, to increase sections when they are found too thin, of course, than to attempt to reduce them once the die is built.

Some grilles are lighter this year than last and others could be made lighter than they are by (a) greater forethought in design, (b) using the grille as a supported rather than as a supporting unit, (c) making the grille of smaller size and/or with larger openings, and (d) using a design which permits of thinner sections. Some of these possibilities have scarcely been thought of, let alone being given adequate consideration. They might go far toward eliminating the criticism of undue weight, which now is a just one. While it is doubtful if the weight can ever be reduced to that of the stamped grille,the die cast grille gives both the appearance and reality of stiffness and sturdiness. However this may be regarded from a strictly engineering angle, it is being turned to effect, perhaps a little unfairly, in selling, when the prospect is asked to compete the "feel" of a die cast grille with the decidedly flexible sheet metal type on cars in the same price class.

Sectional Units of Interest

Another possibility in die cast grille construction yet to be fully explored is that of the built-up type, of which the Olds six grille is this year's noteworthy example. We understand that an important consideration in going to a built-up design had to do with die construction. Four dies are used for making the component parts, and as more men could work on these than on a die for a one-piece job, the dies could be built more quickly. Though not a factor in this instance, these dies can be and are used in smaller machines than are required for one-piece grilles, and many more of such machines are available. In general, the smaller the casting, the thinner it can be made, and this may result in weight saving, though we understand there was none in this instance. In this grille the castings are of nearly semi-circular shape and they are placed in pairs on a rotating fixture, which facilitates polishing in an automatic machine.

It is understood that this grille was suitable for either built-up or one-piece construction, but it is difficult to see how it could have been polished with satisfaction in one piece. In any case, the polishing setup is efficient and production cost

is reported somewhat lower than for a one-piece design, especially in respect to plating. An advantage of a built-up grille is that it is not necessary to replace the entire unit if an accident results in breakage or injury of one or more parts while others remain suitable for use. The Olds six grille is serviced in parts. A complete assembly lists at $15.00, and the major parts at $1.75 and $1.90 each. Dealers and users are reported as well satisfied with this arrangement, and a construction of this kind should go far toward avoiding the criticism of high replacement costs leveled at the die cast grille. Such costs have been too high in some cases, partly because a mark-up of about 4 to 1 has been in effect.* Much lower mark-ups are now charged in some instances, and labor charges have been reduced by making fastenings readily accessible. Breakage is usually the result of another car backing into a grille or of ramming the car ahead with the grille. Such accidents can be minimized by improved bumper design or by the use of inexpensive supplementary guards.

Such changes, and perhaps the use of grilles which are V-shaped or well rounded, as viewed from above, and with the stronger bars of the grille horizontal rather than vertical, should go far to reduce breakage and resulting service costs and to make them negligible factors, as some contend that they are already. Of course no grille, stamped or die cast, can be rendered proof against accident, but the designer should give consideration to methods of preventing damage by minor accidents.

Combinations Work Well

There is much to be said in favor of constructions on the order of that used in the 1937 Buick grille made in two die cast sections with a stamped framework and center section, although it would seem that the die cast parts might be lightened. Other combinations of stamped and die cast parts may well work out to excellent advantage. Sections with short horizontal bars can be cast and polished readily and can be replaced separately if injured.

Today, those who style the car appear to have most to say as to the design of grilles and of other nonfunctional members to be die cast. Their first concern is naturally and properly with appearance, but there are undoubtedly many cases in which they could save in the expense as well as in the weight of die cast parts if they would work closely with the die caster in the early stages of the design, and without any sacrifice in appearance of the finished design. Three 1937 cars have die cast grilles of honeycomb design. These are difficult to cast with a good finish suitable for plating and are also hard to clean of fins. Each hole, of which there are over 1200 in some designs, means a core and often a resulting fin which is almost sure to require some hand filing on four sides of each hole! Machine cleaning is done to some extent where a saving results, but some hand cleaning is unavoidable and the cost is high when so many holes are involved.

*This statement has been confirmed by members of the industry.

Tooling Cost Is Low

In respect to costs, that for the die and cleaning tools for a one-piece die cast grille usually runs from $14,000 upward, perhaps to $25,000 or more, but is far below the tooling for a stamped grille and may bring the total cost per grille, tools included, lower for the die cast than for the stamped grille, at least where the total number of grilles required is moderate. Upward of $300,000 is said to have been the tooling cost for making a stamped grille for one of the highest production cars. The production rate is high and could not be equaled with a single or perhaps even two or three die casting dies, but the difference in tooling is striking even if offset by lower unit costs, especially when the difference in appearance of the product is considered.

Comparisons of this sort may prove misleading, especially as the number of factors involved and the differences in results required may be great. It can hardly be doubted, however, that the die cast grille has made a deserved place for itself in car design and is likely to see wider rather than restricted use if designers make the most of its possibilities.

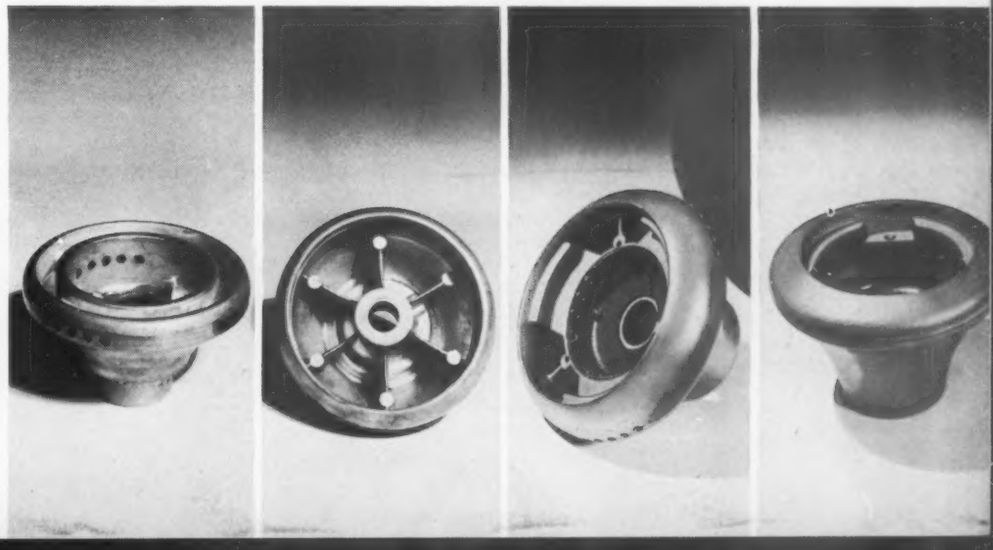
An engineer with one of the most experienced users of die cast grilles recently wrote as follows: "In our opinion, die casting will increase in usage in the automotive field, particularly as applied to body and sheet metal parts. In fact, die cast parts are on the increase because of their neatness of appearance, accuracy and uniformity of dimensions, also their cheapness as compared to stampings of equal appearance. We realize that many die castings may be replaced with stampings, but in most instances the part suffers greatly in loss of character in adapting to a stamping.

"We do not consider die cast grilles more expensive than other types which have the same fine characteristics and appearance. At the time we adopted the die cast grille in 1935, the most important reason for doing so was based on the cost standpoint. During the previous year, our grille costs were nearly 50 per cent higher than the cost of the die cast grille, due principally to inability to control accurately the stamped parts which made up our grille and to control accurately the size and shape of the assembled stamped grille. Die cast grilles have one great advantage, i.e., dimensions, shapes and appearance may be held uniform. We do believe that the die cast grille has presented a sales asset."

Steering-Wheel Applications

Die cast hubs for steering wheels, especially the deluxe type with wire spokes, are extensively used and are an excellent example of an application which is largely structural in character. These hubs vary in weight from about 1.3 lb. to about 6.5 lb., a difference which would seem to indicate that some hubs are heavier than they need be for purely structural reasons. Difference in size, which in turn is dictated in part by the stylist's ideas of correct proportions, have much to do with the weight, but where weight

LARGELY structural in character, die cast hubs for steering wheels are extensively used and are excellent examples of this type of construction. Left to right are shown hubs used on Chevrolet, Hudson, Graham and La Salle



saving is considered important, a study looking toward better metal distribution might well be made in some cases. It is quite common practice to use a steel insert to which spokes are welded and it might result in some weight saving if the insert were extended to include the keyway, where stresses may be highest.

Differences in the design of interior parts of the hub are chiefly those incident to spoke fastening. One of three methods of fastening is usually employed: welding to a steel insert, use of a ring fitting into an annular groove which includes notches cut in the spokes, or screwing the spokes into place. In some designs using a steel insert, the latter is put in place after casting. This saves some time in the casting cycle and has the advantage that welding surfaces are free of zinc. Where the insert is cast in place it is, in at least one case, made a press fit on the core pin and has to be forced over this pin before the die is closed for casting. This requires some special tooling and lengthens the casting cycle with no apparent benefit except to keep the zinc away from the welding surface.

Treatment of Spokes

Three to five wires are used to form each spoke and the holes for these can be cored if the axes of those in each group are made parallel rather than radial. If flat strip spokes displace some round wire, as in the Olds wheel, it is necessary to core the holes for them because of the expense of machining a hole to fit. The coring of holes for wires of circular section as well as those for flat strip naturally increase die cost and may lengthen the casting cycle slightly, but it avoids the need for drilling. A good setup for drilling, using, for example, three Kingsbury or equivalent drill units and an indexing fixture permits of rapid drilling at low cost, even though the drilling of small deep holes requires some care to avoid drill breakage. When spokes are threaded into the holes, it is possible to make them form their own thread, hence separate tapping is not essential.

Despite the stresses imposed on steering wheel hubs, the author does not know of any cases in which breakage has occurred. In a collision resulting from a car running down hill out of driver control, and striking a street car head on, the driver, thrown against the wheel, was hurled into the rear seat sustaining a broken leg and minor head injuries. Although the steering column was bent and the wheel was forced forward so that it dented the instrument panel and was badly distorted, neither the spokes (of Firth Sterling stainless steel) nor the diecast hub were broken, in spite of the fact that the engine was broken loose and pushed back to within about 18 inches of the driver's seat. Had the wheel broken, the driver would probably have been much more seriously injured if not killed. This incident appears to indicate that a flexible-spoke steering wheel may be a safety factor besides having other advantages.

Other applications of die castings to the steering wheel include the horn ring on the 1937 Buicks with de luxe steering wheels. This ring, spokes included, is a light and surprisingly flexible one-piece die casting of zinc alloy. It is cast with the hub web solid and this is afterward split by saw cuts equi-distant between spokes.

The horn ring is also a safety feature, as the driver need not remove either hand from the wheel to sound the horn.

Light Switches Are Cast

Ford light-switches, which surround the horn button, are being die cast this year, whereas a year ago they were molded from plastic and had a die-cast insert. This change is understood to have represented some cost saving and also to have avoided certain difficulties in color matching encountered with the plastic. A Macoid finish to match other interior parts is now applied. Castings are made in a two-cavity die running 400 to 450 shots an hour, and giving a very smooth surface. The only subsequent operation on these castings prior to applying the finish (aside from breaking off the gate and inspection) is an operation performed in a punch press at the rate of about 1500 pieces an hour.

As against this another steering wheel hub is cast in a two-cavity die at about 100 shots an hour, the slower rate being a result of using a steel insert which has to be forced over a core pin (to prevent zinc from coating the inner surface). A special loading fixture for the inserts is needed and has to be lowered between the die halves between shots and the die partly closed to force the rings over the core pin. Cleaning of the hub is done in a press with a shaving die after which the hub is inspected and shipped. Spoke holes in this hub are drilled subsequently in the car manufacturer's plant, where also the central hub hole is reamed and the keyway broached, spokes inserted and welded to the steel insert. Finish includes a priming coat baked for 15 minutes and a final coat baked 2 hours and 40 minutes.

(To be continued)

Book Discusses Methods Of Producing Good Tools

Tool Steel Simplified, 316 pages, 6 x 9¼ inches, cloth binding, by Frank R. Palmer; copies may be obtained at $1 postpaid in the United States from Department 5-E, Carpenter Steel Co., Reading, Pa., or from STEEL, Cleveland; price outside of United States is $3.50 postpaid; in Europe copies may be had from Penton Publishing Co. Ltd., Caxton House, Westminster, London.

This book by the assistant to the president, Carpenter Steel Co., is a handbook of modern practice for the man who makes tools and is the first work of this type and scope to become available. The author's principal reason for preparing the book at this time is the prevailing scarcity of toolmakers at a time when there is a wide need for these

Frank R. Palmer

craftsmen. The book points the ways in which good tools give greater production at lower costs. It contains all information previously published in the company's service bulletins together with other material of practical value.

The average tool made in the average shop, says the author, is not more than half as good as it could be. To make a good tool, the tool must be designed correctly, must be made accurately from the blueprint, must be made of the proper kind of tool steel and must have the right heat treatment. These various phases of the art of making good tools are covered in detail in the book. Of particular value is a section devoted to "things worth knowing" in connection with production of good tools. Profusely illustrated and provided with charts, the book is recommended to journeymen toolmakers and their supervisors, to trade school students, to schools, and to all users of tool steel.

MATERIALS HANDLING

Zinc Spelter Handling Method Uses Consumable Pallet Formed by Load

PALLETS have supplanted time-honored skid platforms for many materials handling operations, and rightfully so because they provide definite economies for certain types of products and for many operations in connection with physical distribution. With broader use of these low-clearance load supporters, fork trucks became more important items of industrial transportation equipment.

Devises a New Variation

A new variation of pallet handling has been devised and is now being used successfully in the plant of Ball Bros. Co., Muncie, Ind. In this plant, the product itself forms the pallet and the entire load, pallet and all, is consumable because the commodity handled is zinc spelter and its destination is into the melting pots. Not only is this consumable pallet interesting and novel, but it has proved economical and efficient.

Ball Bros. Co., producer of fruit jars, receives, unloads, stores and handles through production each year a very large tonnage of zinc. Previous to the adoption of its present methods of handling, this metal was received in 50-pound slabs in freight cars, and required separate handling of each slab. Again, it was necessary to handle each slab into storage and there to pile them. A third handling was involved in moving the slabs from storage to the melting pots. This method of unloading cars and of storage and distribution was laborious and time-consuming, furthermore, it required the services of eight men for approximately 4 hours to unload a single car, and it was not the sort of work that employes like.

Electric Truck Is Used

Experiments to reduce the time of handling and to lessen the hazards arising from heavy lifting resulted in devising a method of interlocking the load, with the base arranged so that it provided entry and clearance for the forks of an electric industrial truck, as shown in the accompanying illustrations.

A freight car transports 30 of these pallet loads to the Ball plant

THE high-lift tilting electric fork truck, shown below, is unloading from a freight car nested slabs of zinc spelter which form their own pallet. Each pallet weighs approximately 2 tons. During shipment, the slabs are bound together with two steel straps

AFTER a pallet load is taken from the freight car, it is run onto a platform scale, as shown at the right, then moved to storage. Pallet loads are stored by the lift truck in stacks three high as illustrated below. Photos courtesy Yale & Towne Mfg. Co., Philadelphia)

MATERIALS HANDLING

and each pallet load weighs approximately 2 tons. When a shipment arrives at the storage siding one electric truck with its operator can unload an entire car in approximately 2½ hours. Two steel straps bind the slabs in each load together.

After each 2-ton pallet load is taken from the car, weighed and carried approximately 300 feet to the storage department, it is placed in its allotted position by the electric fork truck which is of the high-lift tilting type. Pallet loads can be stacked three high by this method. Incidentally, the truck, on its journey with the load, travels around sharp corners, and at one point, it negotiates a 15-degree ramp 30 feet long.

Economies Are Gained

It is claimed that the new system has reduced the cost of unloading zinc approximately $18 per car, and that it has increased storage capacity and lessened accidents with their usual injuries to workmen. The new system also quickly clears the railroad switch tracks. Nine electric trucks in all are in use in the Ball plant and, according to company records, the average annual cost of replacement parts has been $9.23 per truck.

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More Interest Being Shown In Improved Handling

INDUSTRIAL America has started definitely to equip itself to meet successfully new conditions which are being brought about by a changing social and economic order, comments W. V. Casgrain, president, Mechanical Handling Systems Inc., Detroit. This is indicated, he says, by the inquiries which his company is receiving from industries scattered throughout the entire United States.

In this changing social and economic order, Mr. Casgrain asserts, materials handling equipment will prove even more beneficial as 'labor-serving" machinery than it has even during the past decade. The smaller industries, as well as those known as mass production units, are becoming more interested in the value of efficient handling practices.

• • •

Push Crane and Hoist Used for Pickling Work

TWO interesting applications of monorail for handling materials in cleaning and pickling departments have been in successful operation for several months in two New England plants. One of these installations is used by the Bettinger Enamel Co., Waltham, Mass., where a two-hook push crane handles sheet steel. This unit, shown in Fig. 1, is so arranged that the operating box, below one end of the crane and outside the pickling tanks, serves both to push the crane and to control the various hoisting and lowering movements.

Monorail Supports Hoist

The other installation is in the plant of the Glenwood Range Co., Taunton, Mass., and its principal feature, as shown in Fig. 2, is a push-type trolley which supports an electric hoist instead of a motor-driven carrier. A rigid arm is offset at right angles to the monorail track. On this arm are mounted the push-button box with which the operator controls hoisting and lowering movements.

When the operator pushes on the arm to propel the hoist with its load, this action does not cause cramping or binding on the runway as the latter is supported flexibly, further-

(*Please turn to Page* 83)

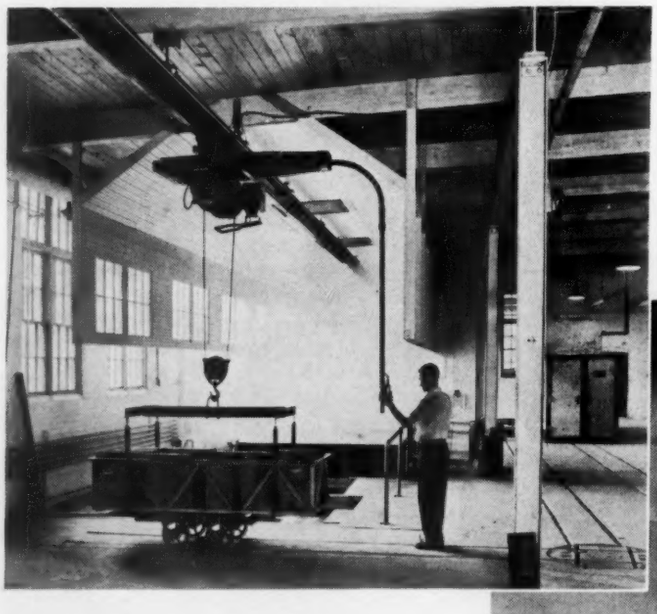
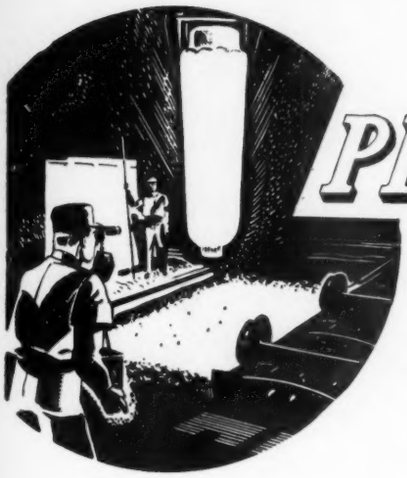


FIG. 1 (right)—Material in the pickling department of an eastern enamel plant is handled by this small two-hook push crane. Fig. 2 (above)—This illustration shows a push-type trolley hoist in a range plant about to pick up a load of steel parts and convey it to the pickling tanks



PROGRESS IN STEELMAKING

Backing Up Refractories with Insulating Material—II

BY G. E. GRIMSHAW

Manager Industrial Insulation Department, Johns-Manville, New York

IN SELECTING proper material the first question is, shall the insulation in back of refractories be a block, a brick, a fill, or a cement?

Too often the type selected while giving apparently satisfactory service is not the most adaptable or durable, and may not be the lowest either in its initial cost installed or in its cost figured on a yearly heat loss basis. The engineer may be influenced by a preference expressed by a mechanic not accustomed to the application of all four types or because a material is recommended as a panacea for all heat conditions.

Each type has a definite place depending upon conditions. There are some few conditions where either the block, the brick, or a cement might serve, one about as satisfactorily as the other, but there are many conditions where one type only will prove successful from a structural and thermally economical sense.

Examples of Various Types

The insulating brick as a backup ties in conveniently with firebrick because they are made in the same size, 9 x 4½ x 2½ inches. They have good insulating value and many of them have greater transverse and crushing strength than other types of insulating material. They would not be adaptable, however, for wall insulation in most ceramic tunnel kilns, because of the irregularity of the inner and outer walls. A fill-type material is the most adaptable in this case.

An insulating cement would be preferable for insulation applied on the outside of brick walls having irregular surfaces; for example, on the walls of old open-hearth regenerators.

The block as a backup has a number of advantages over the other types of insulation, particularly over brick. It will be noted in the data on properties that those made of diatomaceous silica are lower in thermal conductivity and lighter in weight and, therefore, result in lower heat losses and lower heat capacity. They have ample strength and a compressible property that

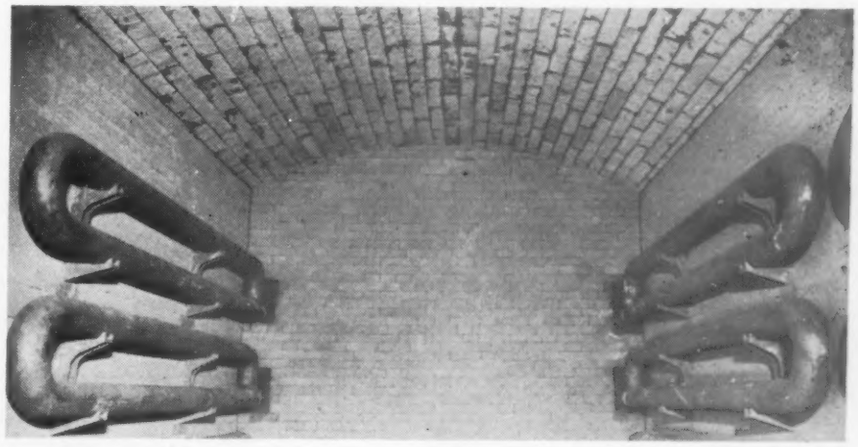
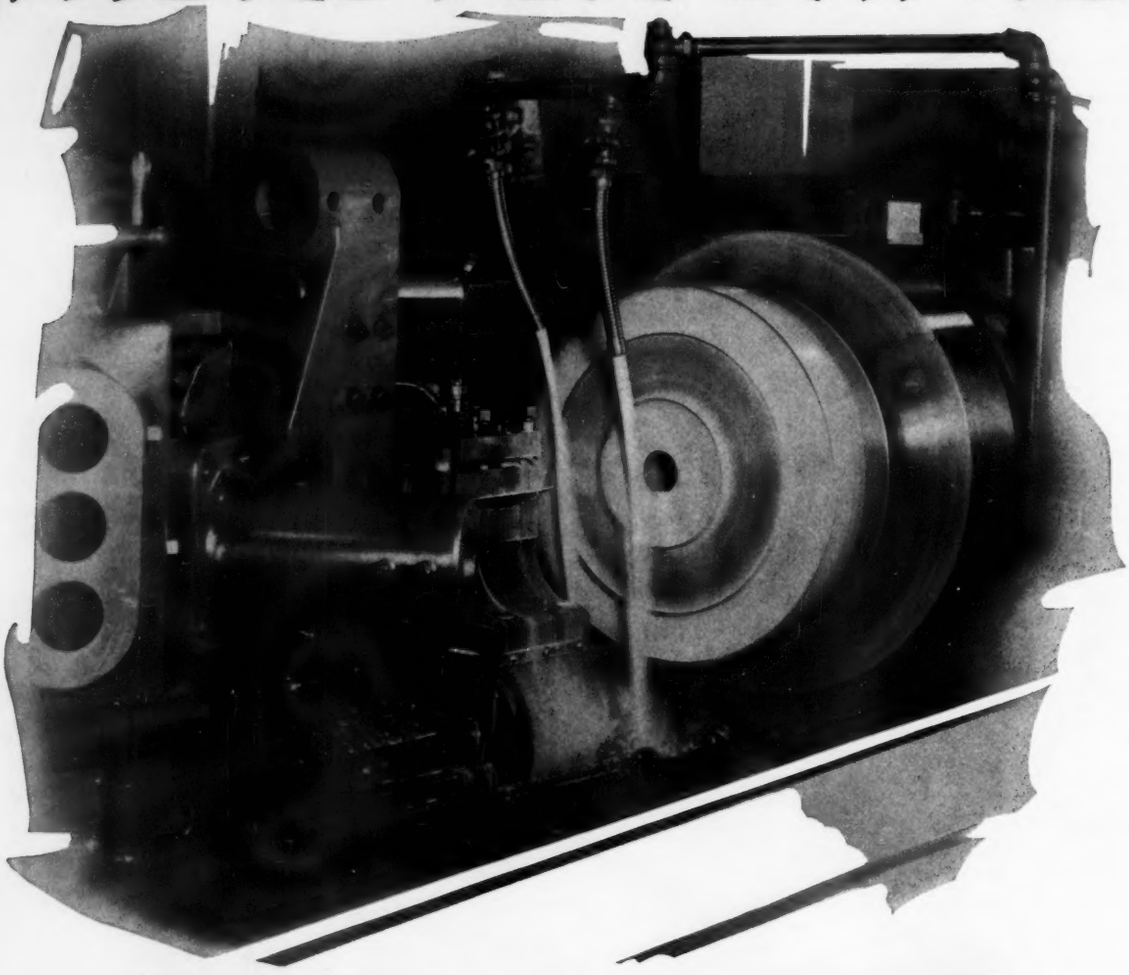


Fig. 4—Block of diatomaceous silica in the roof of a large radiant-type annealing furnace

WHEREVER LATHES



SUNOCO

EMULSIFYING CUTTING OIL

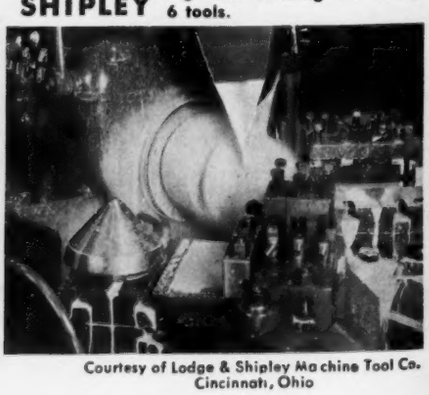
BULLARD Turning 9-inch, S. A. E. 3125 crown gear blank.

Courtesy of The Bullard Co., Bridgeport, Conn.

LeBLOND Finishing all pins for grinding on six-throw crankshaft.

Courtesy of LeBlond Machine Tool Co., Cincinnati, Ohio

LODGE & SHIPLEY Finish-turning, tapering, facing and forming bit cone; 6 tools.



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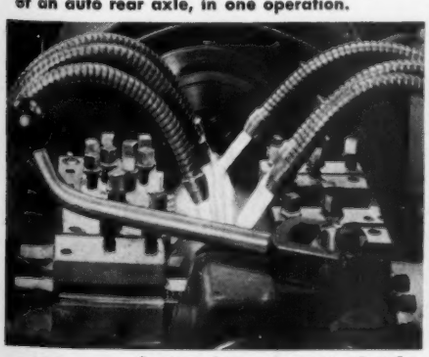
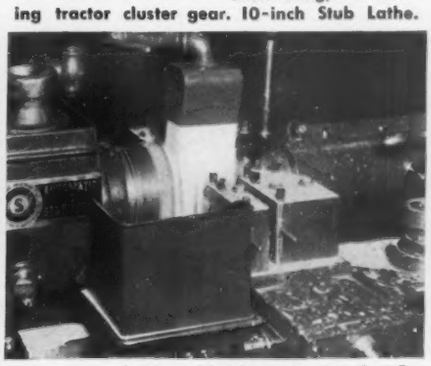


Courtesy of Monarch Machine Tool Co., Sydney, Ohio

SUNDSTRAND Rough turning, facing, chamfering, and forming tractor cluster gear. 10-inch Stub Lathe.



Courtesy of Sundstrand Machine Tool Co., Rockford, Ill.

WARNER & SWASEY Turning, drilling, facing. W. & S. 3A Saddle Type Lathe.

Courtesy of Warner & Swasey Co., Cleveland, Ohio

aids in absorbing expansion. Their dimensions 6, 9 or 12 inches wide, and 36 inches long give a minimum of joints and a lower labor cost of application.

A typical example of block-type insulation is found in the blast furnace stove. The comparison following shows how a diatomaceous silica block of a lesser thickness than insulating brick made of inert mineral fiber and clay gives greater insulating value at a lower applied cost. In addition this lesser thickness of insulation allows of an increase in checker area and the compressibility of the block acts as a cushion to protect the steel shell from ring wall expansion.

Table VI

Properties of 2000-Degree Insulating Firebrick

Density, lbs./cu. ft.	29-33
Modulus of rupture, lbs./sq. in.	70-110
Crushing strength (cold), lbs./sq. in.	90-225
% Volume shrinkage 2000 deg. Fahr., 5-hour soaking heat	0-14
% Linear thermal expansion, 2000 deg. Fahr.	0.46-0.48
Deformation under load:	
Temperature of failure under load of 12½ pounds per sq. in., deg. Fahr.	1900-2230
Spalling resistance, cycles	2-6
Thermal conductivity, 1000 deg. Fahr. mean temp.	1.13-1.4

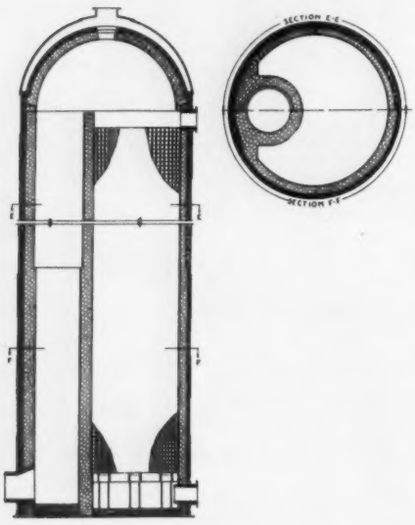


Fig. (5)—Blast furnace hot blast stove showing application of insulation

Longer Life in Refractory

It is reasonable to expect a longer life in firebrick when backed up with insulation. Insulation when placed between firebrick and the steel casing of a furnace creates a more uniform temperature through the firebrick wall, thereby relieving internal stress and reduces tendency to spall. It absorbs expansion which assists in preventing the brick lining from cracking.

An example of longer life in refractories is found in the insulating of open-hearth roofs. Until about three years ago operators of open-hearth furnaces were of the opinion that insulation over the refractory shortened its life. Since then, most open-hearth roofs have been insulated and today the general opinion is that insulation lengthens rather than shortens the life of such refractories.

After a complete examination of silica refractories taken from uninsulated and an insulated furnace after normal operating campaigns, the conclusions were that insulation tends to lengthen the life of a silica roof and to increase its stability under general operating conditions*. Advantages which accrue, in addition to the reduction of heat losses, are as follows:

1. In the insulated furnace, a larger proportion of the refractory is converted to the desirable crystalline types of silica stable at high temperatures, tridymite and cristobalite.

2. In the refractory of an insulated furnace, penetration of molten iron silicate into the pores of the silica refractory of the roof does not set up as high stresses as it does in the refractory from an uninsulated furnace, where it sometimes leads to cracking.

3. The temperature gradient through the silica refractory of an insulated open-hearth furnace roof is lower than in the case of uninsulated furnace. The stresses, due to temperature difference, are less pronounced, therefore, in the refractory of an insulated furnace.

All of these factors tend to greater stability and longer life in the refractory.

Insulating Fire Brick

Due to the light weight and low thermal conductivity of this material as compared with firebrick it is expected that it will replace the heavier wall in a large part of metallurgical equipment operated at elevated temperatures. Therefore, it is necessary to include remarks on the backing-up of insulating firebrick inasmuch as the advantages cited in backing-up the heavy brick also will apply for the insulating firebrick.

While insulating firebrick will replace firebrick in many types of equipment, firebrick will continue to be used where residual heat is needed and where the load on the brick will be a factor; also where conditions such as mechanical abrasion, chemical reaction that will induce fluxing, and slag action exist. Some of the equipment where firebrick will continue to be used is as follows:

Melting Furnaces
Regenerative chambers
Blast furnaces
Hot blast stoves
Rotary cement and lime kilns
Tunnel kilns
Soaking pits
Billet and slab heating furnaces

Insulating firebrick recommended for hot face temperatures up to 2000 degrees Fahr. bear a definite relation to backup block and brick insulation in that most of the 2000 degrees Fahr. brick are offered either as a furnace lining or behind refractories. One of the blocks and some of the brick previously mentioned sometimes are offered for like conditions, but this paper, insofar as insulating firebrick is concerned, will treat only with the 2000-degree brick. No reference will be made to insulating firebrick recommended for temperatures of 2200, 2600 and 3000 degrees Fahr.

Composition

Four brick generally recommended for temperatures up to 2000 degrees Fahr. are:

1. Diatomaceous earth brick made with ground cork filler which is burned out during the firing of the brick.

2. Siliceous kaolin brick made with sawdust filler which is burned out during the firing of the brick.

3. Refractory clay and diatomaceous earth brick made by a gas reaction process.

4. Inert mineral fiber and clay mixed and burned.

The thermal and physical properties of the 2000-degree insulating firebrick using minimum and maximum figures for the four brick are presented in Table VI.

Some of the advantages of insulating firebrick over the fire clay brick are, reduction in time required for heating up, saving in heat during heating up and operating periods

*Lewis B. Miller. "Effect of Insulation on the Silica Refractories of an Open-Hearth Steel Furnace Roof". Bulletin American Ceramic society Nov. 1935, Vol. 14, No. 11, page 364.

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Because they are processed at temperatures higher than any to which they will be subjected in service and hence do not shrink, become dense and lose insulating value, or pull away from the furnace lining to form lanes that let air enter the furnace or gases escape from it. Even at high temperatures they do not disintegrate . . . in fact they are suitable for direct exposure and therefore have a high factor of safety when used for "backing up".

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and, saving in space or increase in furnace capacity.

Economical Thickness of Furnace Insulation

A choice of the proper insulation material should be followed by a consideration of the economical thickness. This thickness depends upon (a) cost of materials in place, (b) annual fixed charges, (c) heat loss per unit area, (d) operating period per year, (e) value of heat.

The equation to determine the economical thickness of insulation as developed by L. B. McMillan (Transactions A.S.M.E. Vol. 48, Page 1269-1317) is:

$$x = \sqrt{\frac{ak}{b}} - Rk$$

in which x is the economical thickness, k is the conductivity, b is the cost of insulation in dollars per inch thick per year, R is the sum of the resistances of all the other elements in the construction including surface resistance, and

$$a = \frac{Y\,(t_o - t_a)\,M}{1{,}000{,}000}$$

in which Y is hours operation per year, t_o is inside temperature, t_a is temperature of surrounding air and M is the value of heat in dollars per million available B.t.u.

For the detailed method of determining the economical thickness by this formula refer to Transactions A.S.M.E. Vol. 48, pages 1300-1305. Typical conductivities of brick and block materials included in this paper and surface resistance are shown in Figs. 6 and 7.

A graphical illustration of economical thickness of insulation for the following assumed conditions is given in three sets of curves for three wall constructions in Figs. 8 to 10.

Curve 1 represents the fixed annual charge of 25 per cent on the cost of material and labor. Curves 2A and 2B represent the cost of the heat loss per year with increasing thicknesses of the two values of heat. Curves 3A and 3B represent the total annual cost which is the sum in each case of the fixed annual charges and the cost of the heat loss per year.

Table VII

Data for Determining Economical Thickness of Insulation

Furnace operating temperature, deg. Fahr.	1800
Operating time per year, hours	3600
(a) Natural gas per M cu. ft., dollars	0.25
Calorific value, B.t.u. per cu. ft.	1000
Furnace thermal efficiency, %	40
Cost per million B.t.u., dollars	0.625
(b) Electricity per kilowatt hour, dollars	0.0075
Furnace thermal efficiency, per cent	100
Cost per million B.t.u., dollars	2.20
Cost of insulating brick per M delivered, dollars	100.00
Firebrick per M delivered, dollars	50.00
Cost of labor of application per M, dollars	20.00
Cost of block insulation/sq. ft./inch, dollars	0.174
Cost of labor of application per sq. ft., dollars	0.05
Annual fixed charge material and labor, %	25

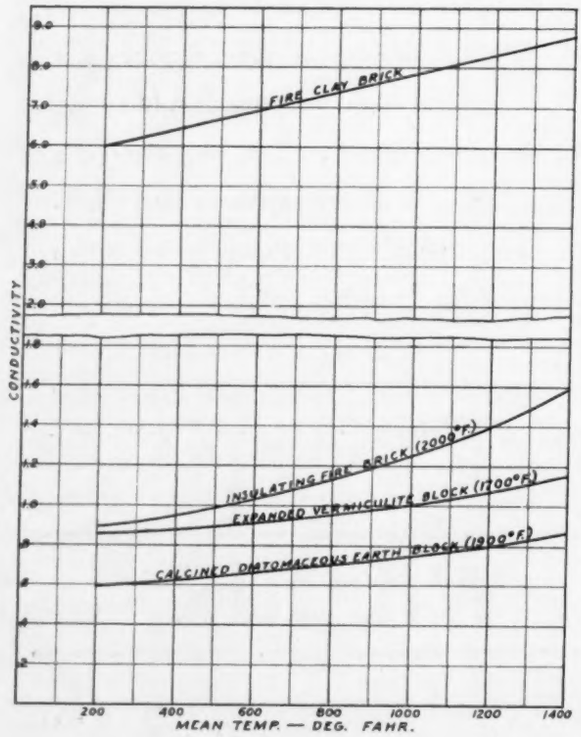
Determining Wall Thickness

The economical thickness for any particular condition is naturally that thickness resulting in the lowest total annual cost.

Combining block with firebrick it is to be noted that for brick 9 inches thick, the economical thickness of block, using natural gas, is about 7 inches, and using electricity, 14 inches. With a 13½-inch firebrick wall there is but little change in the economical thickness of the block.

If insulating firebrick replaces the firebrick wall the economical thickness is 10 inches using natural gas, and 18½ inches using electricity. From a practical standpoint and if the economical thickness was your guide a satisfactory wall would consist of 9 inches of insulating firebrick backed up with 1-inch or preferably 1½-inch block insulation where natural gas is used as fuel.

Since the insulating firebrick is so much lower in conductivity than the firebrick, which it has replaced in some types of furnaces, it has been



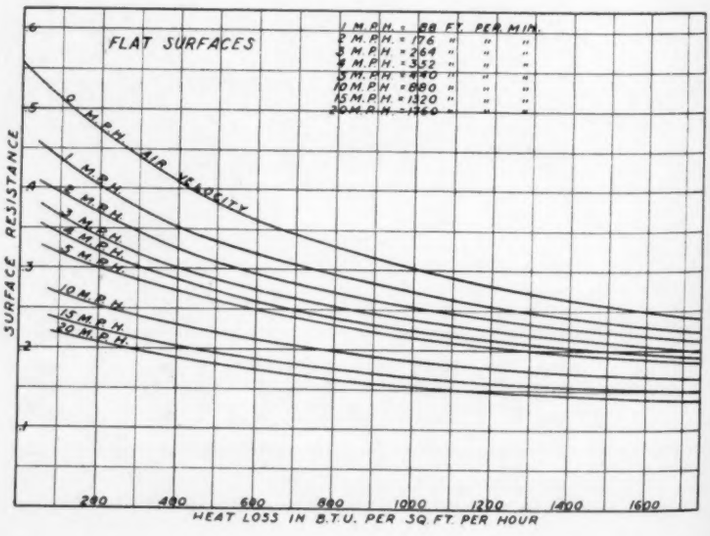
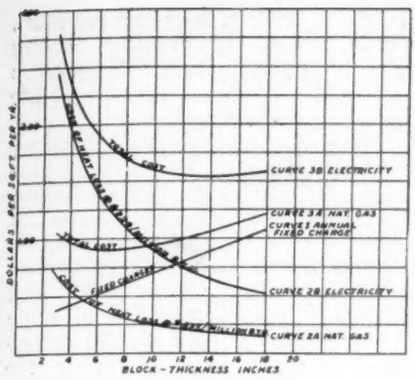
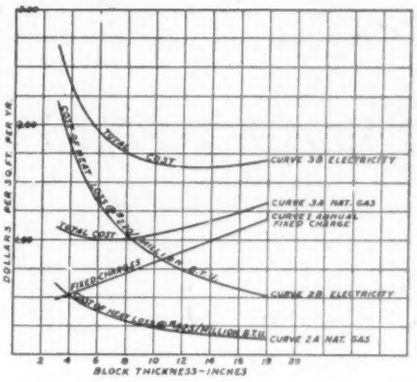


Fig. 6 (Left)—Thermal conductivities of firebrick and insulating brick and block. Fig. 7 (Below)—Surface resistance curve for still air and wind velocity conditions





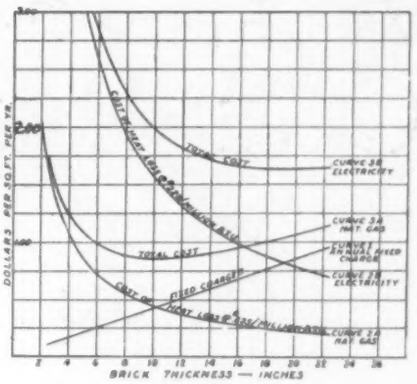


Fig. 8 (Left)—Economical thickness of insulation using 9 inches of firebrick and block of diatomaceous silica. Fig. 9 (Center)—Economical thickness of insulation using 13½ inches of firebrick and block of diatomaceous silica. Fig. 10 (Right)—Economical thickness of insulation using 2000-degree insulating firebrick

considered unnecessary to combine the insulating firebrick with materials of a lower conductivity such as block. In the designing of furnace walls and roofs involving the use of insulating firebrick it will pay to give consideration to combinations of this material and block insulation if structural conditions will permit, for there are many advantages in the construction.

Longer life can be expected in the insulating firebrick when backed up with insulation for the same reasons that apply to firebrick. The cushion of insulation between the brick and the casing is an expansion absorber—the temperature is more uniform through the wall giving greater resistance to thermal shock in intermittent operation and reducing tendency to spall.

In addition to these advantages the combination wall may allow for a lesser thickness of insulating firebrick, and in such cases lower head capacity can be expected because of the lower density. It will reduce the time required to bring the furnace up to temperature and to cool it down and, it will effect either a reduction in floor space or an increase in furnace volume.

Specification No. 4 in Table VIII has been used successfully in the walls and roofs of radiant tube type annealers, in car wheel annealing pits, and in gas flues where the velocity runs about 3000 feet per minute.

Insulation in back of refractories of high or low density is just as important today as before the introduction of the insulating firebrick. With so many insulation materials available in the form of block, bricks, fills, and cements, none of which are adaptable for all conditions, it requires careful study in making the proper selection. Insulation like many other materials serves best when it is selected on the basis of adaptability, durability and efficiency.

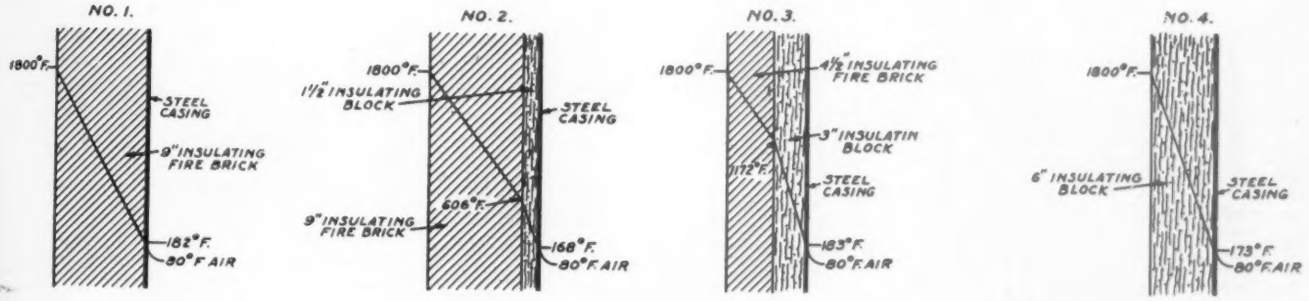


Fig. 11—Examples of insulating firebrick and diatomaceous silica block constructions

Table VIII

Various Specifications for Insulating Materials

	No. 1	No. 2	No. 3	No. 4
Weight per sq. ft. of surface, lbs.	22	25	17	12
Heat loss, B.t.u. per sq. ft. per hour	217	183	224	200
Cost of heat loss per year, dollars	0.235	0.198	0.242	0.216
Cost of materials and labor, dollars	1.54	1.85	1.34	1.14
Fixed charge 25 per cent, dollars	0.385	0.463	0.335	0.285
Total cost per year, dollars	0.620	0.661	0.577	0.501

The above analysis is based on the following:

Hours operation per year	3600
Cost of fuel per million B.t.u., dollars	0.30
Cost of brick per M, dollars	100.00
Cost of labor per M, dollars	20.00
Cost of block per sq. ft., dollars	0.174
Labor per sq. ft., dollars	0.05

Open-Hearth Operators Discuss Problems Of Steelmaking

IN PRESENTING a general resume of refractory practice at the national Open-Hearth conference and meeting of Blast Furnace and Raw Materials committee of the American Institute of Mining and Metallurgical Engineers, at Hotel Tutwiler, Birmingham, Ala., April 7-9, Dr. W. J. McCaughey, Ohio State university, Columbus, O., pointed out that calcined magnesite contains as its essential constituent magnesium oxide, which, when crystallized, is known as the mineral periclase.

A report of the early proceedings of the Open-Hearth and Blast Furnace and Raw Materials committees was presented in last week's issue of STEEL.

Dr. McCaughey stated that magnesia in the form of periclase offers peculiar advantages for use in basic open-hearth furnaces. It has a melting temperature of 5072 degrees Fahr., the highest melting temperature of the common refractory oxides. It has a specific gravity of over 3.6, which should help resist the floating action of the metal bath. He explained that its hardness of six, equal to cold steel, would enable it to resist abrasion. Its most valuable properties, however, are chemical. It has a low solubility in basic open-hearth slags, and possesses the property of absorbing several times its own weight of iron oxide without seriously impairing its use as a refractory.

Present in Round Bodies

In high magnesia refractories, he continued, the magnesia generally is present in the form of rounded pea-like bodies of microscopic dimensions. These periclase grains do not seem to have the ability to develop into larger particles to form more coarsely crystalline structures. This habit of forming aggregates of rounded periclase grains instead of large interlocking crystals is peculiar to high magnesia refractories as matured in steel furnaces. This type of structure, he warned, requires the presence of an auxiliary bond and in general the structure of basic magnesia bottoms is one of periclase grains cemented together by other minerals which at operating temperatures may in part form a liquid.

Dr. McCaughey pointed out that a deposit of brucite (magnesium hydroxide) was found in Nevada. Here it occurs in massive deposits and is remarkably free from siliceous impurities, or the impurities are in such coarse fragments that they are removed easily in the mining operation. The availability of such a deposit of high magnesia, low silica mineral made it desirable to use such a mineral deposit before a magnesia separation process based on dolomite was reduced completely to commercial practice. Brucite, when calcined, yields magnesium oxide which is particularly suitable for the commercial development of a calcium ferrite bonded magnesia refractory.

Manufacture of a calcium ferrite clinker calls not only for a low-silica source of magnesia, he warned, but also for careful proportioning of the lime with respect to the silica and iron oxide, and careful furnace control to insure the formation of calcium ferrite.

With careful control of raw materials and firing, a calcium ferrite bonded, high-magnesia refractory was made, of the following composition.

Element	Per Cent
Silica, SiO_2	2.5
Iron, Fe_2O_3	7.0
Alumina, Al_2O_3	1.0
Lime, CaO	10.0
Magnesia, MgO	79.5

Calcium ferrite developed in the foregoing refractory produces hard, dense, refractory granules having a bulk density of 125 to 135 pounds per cubic foot, and a true specific gravity of about 3.6.

Mineralogically, such a refractory consists of about 79 per cent periclase, 13 per cent calcium ferrite, and 8 per cent calcium silicate. At furnace temperature, the calcium ferrite fluxes part of the calcium silicate, producing some 16 per cent of bond. Sufficient calcium ferrite is formed to rapidly set the refractory in the furnace. However, the amount of both calcium ferrite and calcium silicate is maintained as low as possible in order to avoid refractory dilution. Magnesia is kept as high as possible to provide a maximum amount of periclase which gives permanence to the refractory and resistance to iron-rich slags.

Based on these principles, the speaker stated, a carload of this high-magnesia, calcium-ferrite-bonded refractory was manufactured and a trial undertaken on a 150-ton furnace.

To distinguish it from other basic refractories, Dr. McCaughey said in conclusion, the high-magnesia-ferrite-bonded refractory was given the name Thomasite in honor of the man who developed both the basic open-hearth process and also the refractories that made it possible.

How Bottoms Are Made

One open-hearth superintendent in explaining how open-hearth furnace bottoms are installed quickly, mentioned that he rammed in a cold mixture of magnesite and tar enmass and after 72 hours of warming up, the furnace was ready for charging.

At another plant after the brick was put in as usual, a mixture of 80 per cent magnesite and 20 per cent of bond was rammed in place, a thickness of 6 to 8 inches up to 14 inches being used next to the tap hole. The bonding material is composed of chrome plastic and cement. Recently, however, sodium silicate has been substituted for the bond just mentioned.

Various procedures are followed for lining furnace runners. At an Ohio plant after the clay is dry it is faced with a coating of graphite in order to close up all openings. At another plant a mixture of one-third clay and two-thirds loam is used to line the runner. At a Pittsburgh shop a mixture of ganister, loam, fireclay and brick is employed. Another operator employs four parts of ground crucibles, two parts of ganister, and one part of white clay.

From 19 to 20 heats are being obtained from ladle linings made of 3-inch circle brick laid up with

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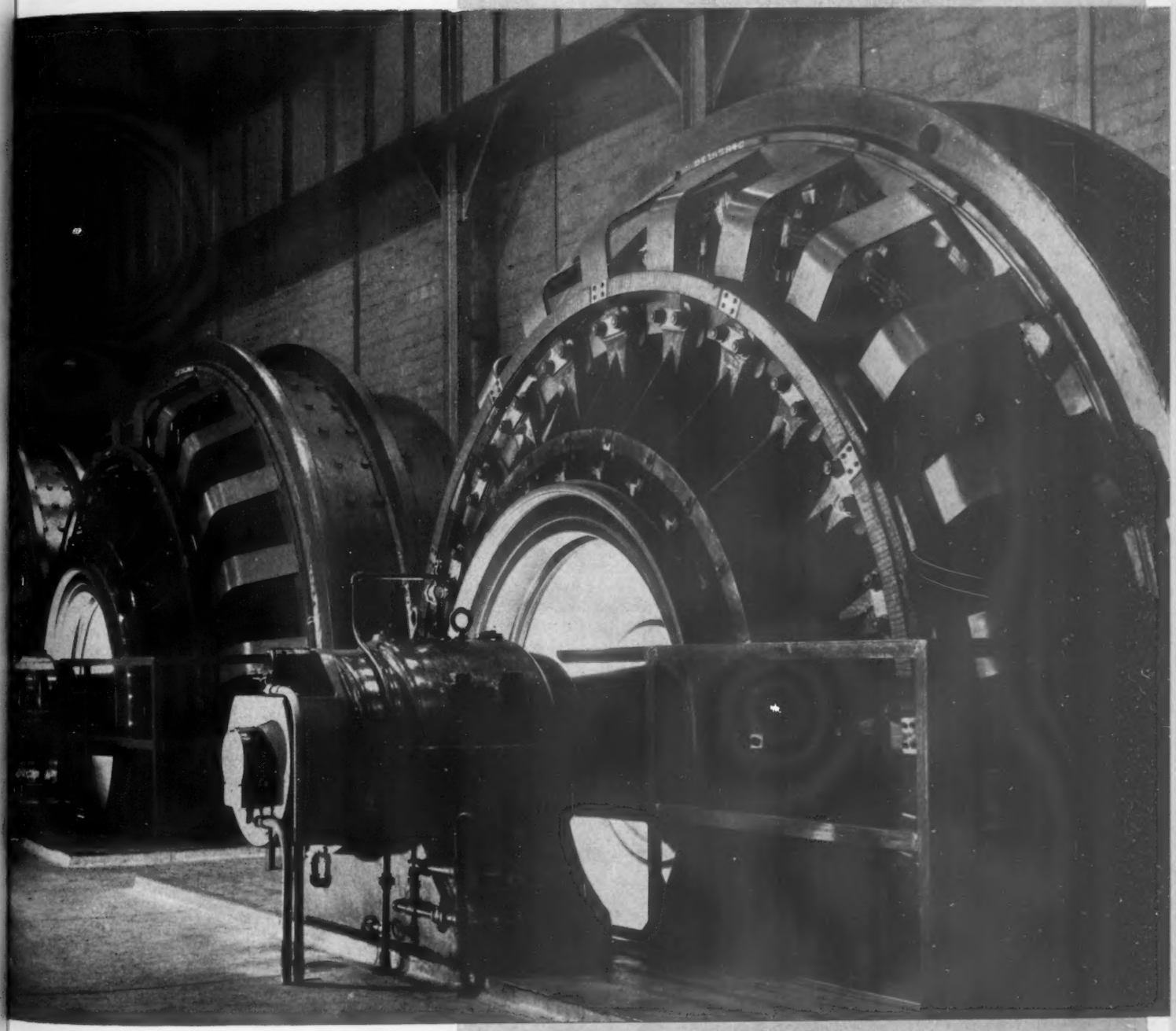

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high-temperature cement. Patching becomes necessary after about the twelfth heat.

At another plant ladle linings vary in thickness from 7 to 9 inches. The brick are laid up with 8 per cent calcine and 20 per cent plastic clay. All wall joints are loamed and horizontal joints calcined. About 14½ heats per ladle are obtained. One operator asserted that the life of ladle linings depends upon the depth of slag carried. By running a shallow depth of slag the consensus of opinion is that longer ladle life is obtained. On rimming steel from 21 to 23 heats are about the average and on low-carbon heats about 26 to 27 heats.

In discussing the use of natural gas for fuel one operator reported the consumption of 6000 cubic feet per ton of steel including that used for runners, ladles and nozzle drying. Satisfactory use of natural gas for open-hearth firing depends upon the furnace design according to an Ohio operator. He reported an average of 4,200,000 net B.t.u. consumption per gross ton of ingots and that the products of combustion leaving the furnace average from 2 to 4 per cent oxygen.

Temperature Is a Factor

Prof. T. L. Joseph in summarizing the effect of oxide in steel and temperature of pig iron, at the joint session of open-hearth and blast furnace groups directed attention to the fact that temperature measurements furnish an index of the sulphur and silicon content in iron. When the temperature drops, he pointed out, the percentage of sulphur increases while the silicon decreases and vice versa. An increase of 20 degrees in the temperature of iron accounts for an increase of 5 points in silicon and a decrease of 1 point in sulphur. The speaker emphasized that there is no evidence that oxide in the iron persists through the open-hearth. It was brought out that the sulphurization in the open-hearth depends upon the temperature of the metal, slag volume and slag viscosity.

The kind of iron preferred by open-hearth operators varies according to expression. One operator preferred this specification: Silicon from 0.60 to 1.10, sulphur as low as possible, manganese from 1.50 to 2.00 and phosphorus 0.250 per cent.

Steelmakers cannot agree upon what determines the quality of pig iron. The open-hearth man says any great swing in the silicon content will give disastrous results and cause bad quality steel. One operator contended that the burden of producing high-quality iron should rest upon the shoulders of blast furnacemen and that of high-quality steel on the open-hearth men.

An authority on blast furnace practice pointed out that the present state of raw material offers a real problem in blast furnace practice. He regarded size preparation of raw materials as an important factor in the successful operation of furnaces. In his opinion blast furnacemen are doing the best they can with the raw materials available and he emphasized that there must be some improvement in practice before a more uniform iron can be produced.

What Is Good Pig Iron?

Based on a study of extensive and intensive research projects, Ralph Sweetser, consultant in blast furnace practice, New York, asserted that the percentage of combined carbon is the most important factor, if not the controlling factor, in determining whether iron is good or bad for certain uses, analysis, such as silicon, sulphur, total carbon, being the same.

The speaker expressed his opinion that the percentage of combined carbon in a pig iron is the one chemical analysis which can be used safely as an indicator of its present character, its past environment and its future behavior.

The open-hearth men have asked the blast furnace men why they should not run the sulphurs under 0.020 per cent. One answer to that question is that the open-hearth men have not presented proof that it would be desirable to have sulphurs that low. It has been Mr. Sweetser's personal observation that such low sulphur is usually associated with a "mushy"-running pig iron. It is more probable that what the open-hearth men want is low combined carbon, he stated.

As a rule in making iron of a certain grade with a regular coke there is not much variation in the amount of total carbon, and it is possible that the percentage of this element is not under the control of the furnace manager. On the other hand, the speaker maintained that the percentage of combined carbon is almost completely under his control, and the answer to the open-hearth man is, "yes, we can give you the percentage of combined carbon you specify, in amounts varying from 100 down to 2 per cent of the total carbon present in the pig iron."

The open hearth men have asked why not run sulphurs under 0.020 per cent in basic pig iron. Of course the blast furnace men could operate so that the sulphur would be that low, but whether it is necessary, desirable or economical is a question that could be answered by making a test run at the blast furnace, and also at the open-hearth furnace. It is most likely, said Mr. Sweetser, that the blast furnace slag would have to be more basic than is the usual practice. It is evident that temperature alone, or basicity alone, is not the answer for sulphurs below 0.020 per cent, but rather a happy combination of low-sulphur coke, a hot-bottom furnace, the right fluidity of slag and smooth regularity of blast furnace practice combined with a clean hearth and clean furnace walls.

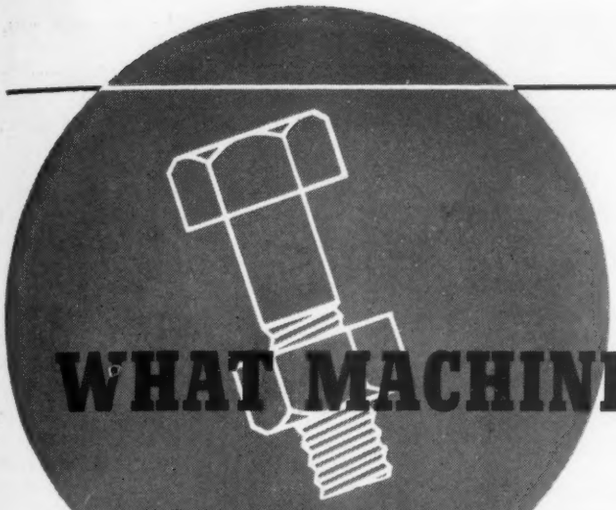
Use of 35 per cent scrap in blast furnace burdens accounts for high-chipping costs according to one open-hearth superintendent. Under this practice he cited chipping costs ranging from $4.50 to $8.00 per ton. When scrap was not included in the burden, he stated that open-hearth troubles leveled off and melters were able to obtain 90 to 92 per cent of their analyses. Chipping costs were reduced to $1.25 per ton. This condition prevailed until the blast furnace began charging scrap. Chipping costs increased as scrap in the furnace burden increased.

Scrap Not Deleterious

Expression from blast furnace operators regarding the use of scrap in the burden was that good quality iron can be obtained with or without the use of scrap. An Ohio pig iron producer using 50 per cent scrap in the burden put through his furnace 15,000 tons. The iron averaged from 0.80 to 1.10 per cent silicon and 0.025 per cent sulphur. Another blast furnace operator using 18 per cent scrap in his burden reported that in 780 casts not one exceeded 1.25 per cent silicon.

On medium carbon steels in the range of 0.20 to 0.25 per cent carbon sodium fluoride added in the molds exerts a marked influence on the ingot according to a steelworks metallurgist. He pointed out that the use of this fluoride changes the action in the rise in the mold and affords some surface improvement. There is no difference in the segregation nor is there any change in the quality of the steel. At one open-hearth shop tapping 0.06 to 0.08 per cent carbon rim steel on the cold side an addition of 2 ounces of sodium fluoride per ton of steel increased the rimming action and eliminated thin skin ingots. At another shop 2 ounces of the fluoride is used on lower carbon steels and 3 ounces on higher carbon grades for best results. Discussion brought out the fact that most of the fluoride goes out either in raw powder or flame in the raw ingots. Consensus of opinion is that sodium fluoride has marked advantages in

(*Please turn to Page* 81)



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OR ROLL THREAD

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MANVILLE
COLD FORGING MACHINES

WELDING, ETC.

BY ROBERT E. KINKEAD

Fifty Years of Arc Welding

REPRODUCTION of an old wood cut below, showing an electric arc welding shop in the year 1887, indicates the extensive progress made in 50 years of commercial welding. Presumably, the storage battery was the source of energy for arc welding. Wiring shown is not up to modern standards, but plenty of welding shops are as careless with their low-voltage welding lines as is indicated here. But whether the battery of cells shown was a storage battery or a battery of galvanic cells, it is apparent no resistance ballast was used in the arc circuit. Since the operators are shown with carbon electrode holders it may be understood how they could get along without resistance ballast.

The cylindrical shell on which the operator is working seems to have wedges driven between the edges to be welded in accordance with the practice which was common for many years after 1887, although seldom used now. The purpose of the wedges was to keep the edges from coming together or overlapping, thus leaving no place to put the weld. As the weld progressed, the wedges were removed and inserted further ahead of the arc.

It is a fair assumption the shop shown was a boiler shop but that the work shown was for tanks or pipe. Certainly any boilermaker who welded a boiler drum 50 years ago with an open carbon arc has been dead these many years and if he is not dead it is because he stayed away from the boiler when the engineer got up steam pressure. The modern carbon arc with autogenizers, fluxes and the like, will make welds suitable for boiler drums, but the carbon welding arc of 1887 made a weld in wrought iron that might be anything from a good grade of gray iron to a mess of cinder containing up to 80 per cent iron oxide.

IN this column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL.

Few Welds Fail

THE psychiatrist teaches his patients that most of the things they worry about never happen. Engineers who deal with welding teach that all the undesirable things that can happen will happen along with a good many other things that could not be foreseen when the job was planned. The difference lies in the fact that engineers, in the practice of their profession live in a reasonable world, while the psychiatrist deals with the vagaries of the human mind. Both get good results by practicing exactly opposite philosophies.

The number of weld failures is unbelievably small because people who deal with welded construction have a wholesome fear of the consequences of failure. Fear of consequences is a necessary and useful tool in engineering. The fact that a few engineers become obsessed with their fears is of no more significance than the fact that a small percentage of individuals become afraid of life and have to have the services of a psychiatrist to get rid of their fears.

The man who will not take a chance on welding under any circumstances is simply ignorant of the fact that he is taking chances on welding every day unless he stays in bed some place where the airliners (which have a great deal of responsible welding on them) cannot fly over him.

Success in Welding

BLAKE CRIDER, Cleveland psychologist, cites surveys of Carnegie Institute of Technology and Harvard university to prove personality means increased income for technically trained men. The current wave of psychology literature led by Dale Carnegie will perhaps give the technical schools some new ideas on the subject.

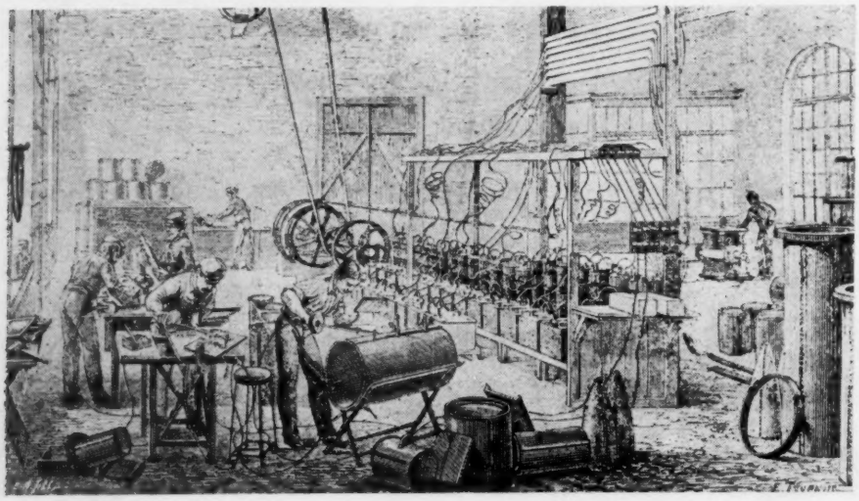
The conclusion, in the case of Carnegie Tech, that success is 15 per cent technical knowledge and 85 per cent personality seems somewhat optimistic to us. But it is an observed fact acknowledged by many college faculty members that a good many of their students who are hell-raisers and deficient in their studies do go out into the world and make good. Everyone who has been to college can cite such cases to the mortification and chagrin of the faculty.

Perhaps the underlying facts may be stated more conservatively by saying every man should know the technical business in which he is engaged and in addition thereto, if he ever expects to make any money by the practice of his profession, he should know how to influence people and make friends. To put the psychology ahead of technical knowledge is to turn the technical professions into groups of chiselers who are running around trying to put over "deals."

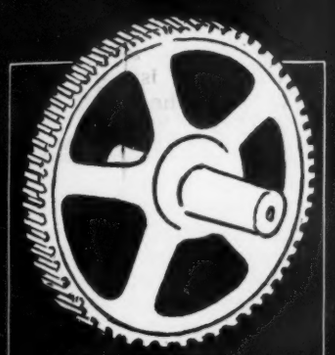
The man who engineered the welding at Boulder dam is one of the most charming persons one could hope to meet but he also happens to be one of the best welding men in the country.

The key in the door to success in the technical world has to lift three tumblers — technical knowledge, sound judgment, personal attraction.

Photo Courtesy *The Welding Journal*

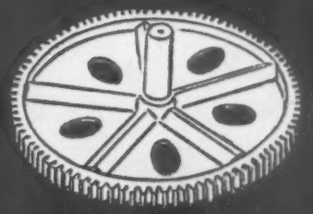


Sketchbook of Welded Parts



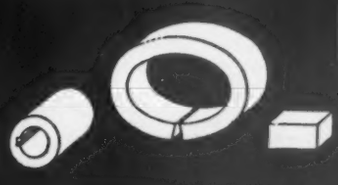
GEAR—Traditionally of cast iron construction. Must be over-weight in order to withstand severe impact and fatigue stresses.

These parts, cut from standard mill stock, comprise the welded gear at the right.

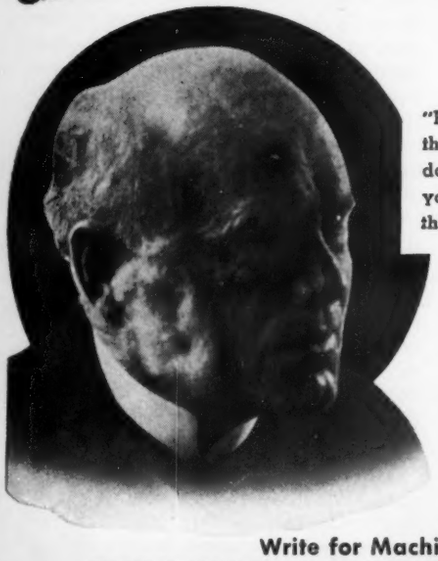


The "Shield-Arc" welded gear. With the full strength of steel, it can "take it." Weighs 20% less—costs 10% less.

CAM—Small though it may be, this part can be changed to unbreakable welded steel construction.



A piece of bar stock bent as shown, a piece of tubing with a keyway milled in it and a small bar piece—these parts, "Shield-Arc" welded together, make the steel cam shown.



"Rubber and road engineers have given the motorist a big break, Lad. In the old days, if you went 50 miles without a flat, you were lucky. The flat-tire profanity that originated in those times is still tops."

"Right, Pop... And design engineers are giving machinery users a break by eliminating *breaks* through the use of welded steel parts. It's a clean, fast way to go to town. The only 'flats' in this set-up are *costs* and *weight*—and they reach bottom all around!...With progress like this, aspiring parrots will soon have to originate their own home-spun profanity."

Write for Machine Design Application Sheets. Issued periodically.

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SURFACE TREATMENT AND FINISHING OF METALS

Small Electric Heating Unit Doubles Output of Silver Plating Plant

THE usual output of silver plating equipment at the plant of Northern Ohio Plating Co., Cleveland was doubled by use of a simple electric heating unit. No other changes or additions in equipment were made.

Silver plating in this plant is carried out in a 140-gallon tank, part of which is shown in the accompanying illustration. Articles to be plated are cleaned free from grease and dirt, hung in this tank and given a coat of silver. They are then removed and scratch brushed. Four layers of metal are deposited on each article with a scratch brushing after each coat.

In cool weather the silver platers encountered a difficulty which seriously limited the speed of plating and the plant's capacity. Speed of plating not only depends upon the current density but also upon the amount of silver salts in the solution.

At night, before the heating unit was installed, the temperature of the solution dropped to such an extent that a large amount of the silver cyanide precipitated out of the solution and formed a deposit on the bottom of the tank. When work was started in the morning so much silver cyanide had precipitated out that the metal was deposited very slowly. The addition of more salts did not remedy the matter because the cold solution was already saturated and would dissolve no more at the reduced temperature. Satisfactory operating speed was reached only after several hours' use when heat developed by plating had raised the temperature of the bath to a point where all the cyanide salts could be maintained in solution.

The amount of heat required to keep the solution up to temperature when the shop was not operating was found to be very low; so low, in fact, a 250-watt electric heater unit would do the job satisfactorily.

The heating unit was made by inserting a General Electric Chromalox strip heating unit into a section of 2-inch lead pipe. The pipe was sealed off and bent in the shape shown in the accompanying illustration. Results of the use of this simple electric heating equipment have been very satisfactory. Each night the unit is turned on and it maintains the tank temperature so efficiently work can start at full speed in the morning.

Production Is Doubled

Because work can start immediately each morning and because metal is deposited at a much higher rate, it is now possible to plate two loads of material daily, whereas only one load per day was previously handled. The two loads are now run in three hours less time than the one load previously required.

The heater has also been found useful in bringing new solutions up to working temperature. If a fresh solution is made on a Saturday morning, using water at the usual temperature found in water mains, the heater will furnish sufficient heat over the week-end to permit full speed operation of the bath on Monday morning.

The cost of a 500-watt unit complete with lead pipe amounted to approximately $5.00. The cost of electric current consumed was negligible.

For heating large tanks which must be operated at elevated temperatures this company uses a gas heated, circulating hot water system which they developed for their own use. Lead pipes, set a short distance above the bottom of the tank, are connected to a small domestic gas-fired water heater. The

STRIP heater unit is inside lead pipe held by operator. When in use it is lowered into bath in position shown

hot water circulates by convection only and gives satisfactory results without the aid of a thermostat.

Heating methods of one type or the other are used in this plant for black nickel, bronze and all cyanide solutions.

Anticorrosion Materials Described in Bulletin

Since many users of antirust compounds are not in a position to make up their own formulations, Alox Corp., P. O. Box 556, Niagara Falls, N. Y., has prepared Bulletin 37-1 describing tested compounds sold ready for use, which they are now placing on the market.

The base materials used in all these products are derived wholly from petroleum and are nontoxic. The solvent used is also a derivative of petroleum, carefully chosen for its freedom from sulphur or sulphur compounds which are so often responsible for staining of metal surfaces. It is an accepted safety solvent with a flash point of approximately 100 degrees Fahr. and a fire point of approximately 155 degrees Fahr.

Each compound is formulated to withstand certain corrosive conditions and has been thoroughly tested before being recommended. For isolated cases of corrosion under conditions where the usual line of slushing oils will not prove applicable, this company maintains a staff thoroughly experienced in formulating antirust compounds for special conditions.

Samples of these compounds and the bulletin describing their use may be obtained on request.

Offers New Type Flow Gun For Sealing Compounds

Binks Manufacturing Co., 3114 Carroll Ave., Chicago is offering a new type of a gun, known as the Binks Thor Model 12 flow gun. This gun is designed for the application of sealing compounds such as rubber cement, cut-back and emulsified asphalts and similar heavy materials. Uses no atomizing air, but simply "flows" the material under air pressure from a pressure material tank.

It is used as a sealer gun for application of material around mouldings and crevices on automobile bodies, refrigerators and the like. Can also be used to lay a heavy stripe of paint where spray application would be impossible. The No. 12 gun can be furnished with nozzles which will lay a heavy line from ¼-inch to 6 inches in width.

Air pressure on tank varies with the viscosity of material and length of hose used. For sealing materials in ordinary use with 15 to 20 feet of ½-inch material hose the recommended air pressure is from 15 to 20 pounds.

One of the outstanding features of this gun is the almost straight passage from material inlet to the nozzle. Thus the possibility of clogging is reduced to a minimum. Nozzle can be swiveled in any desired direction. Material connection is standard ½-inch pipe thread. Nozzles for this gun are ¼, ⅜ and ½-inch round.

Trailer Showroom to Demonstrate Lacquer Products at Consumers' Plants

TO DEMONSTRATE its industrial lacquers and synthetic coatings at various consumers' plants Roxalin Flexible Lacquer Co. Inc., Elizabeth, N. J., has constructed and equipped an especially designed trailer—a salesroom on wheels — which is now about to go on tour.

The trailer, shown in an accompanying illustration, is known as the Roxalin Trail Blazer. It is 22 feet long, attractively finished in two shades of blue and aluminum, and is provided with heating and air-conditioning equipment. It is furnished with specially lighted show cases and cork lined panels for display purposes. A table and seating facilities for several persons are provided.

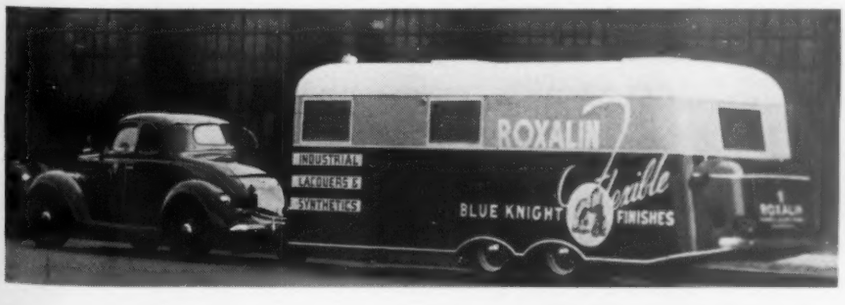
More than 200 parts and assembled products, actually in commercial production, are on display. All are finished with Roxalin coatings designed to give high resistance to chemical and physical abuse. Basic materials upon which finishes are shown include metals, wood, rubber, textiles, leather and paper.

Among the displays of interest to manufacturers of metal products is included clear coated metal foil, portions of which have been completely eaten away by nitric acid without damaging the lacquer film. Steel tubes finished with this material are shown to withstand hard blows against each other without chipping, flaking or peeling.

The ability of certain types of finishes to withstand blanking and forming operations is shown in many interesting cases. Among the special finishes is one which is said to resist all plating solutions, including chromium. It can also be buffed without "drag". Another is an easily controlled synthetic wrinkle finish which is said to be fined grained, highly resistant to perspiration and free from "fatty" edges.

Two of the company's products are combined to produce an interesting finish on zinc and aluminum base die castings. The first coat, which dries in lacquer time, is followed immediately by the second coat, the wrinkle finish mentioned above. The combination is then baked for an hour at 275 degrees Fahr. New fashions in finishing, resulting from original stencil applications and two-tone work done with only one baking, are thus demonstrated.

Applications of flexible finishes to non-metals are also displayed. One application, for instance, is illustrated by textiles which have been printed with finishes without stiffness; others by galoshes and rubber products coated with flexible lacquers and by rubber and textile-covered cable, the latter to resist army and navy specifications, to resist high heat, moisture and hot oil. They are said to possess high dielectric strength.



Co-operation in Foundry Is Means for Reducing Costs

ATTRACTING an attendance close to 400, the first New England regional foundry conference held at Massachusetts Institute of Technology, Cambridge, Mass., April 9-10, proved to be one of the most successful metal trades events ever held in the district. The conference was arranged under joint sponsorship of the New England Foundrymen's association and American Foundrymen's association, but other technical groups co-operated in a program covering all branches of the foundry industry from pattern designing to machining.

The program included a good variety of technical papers, several laboratory visits and practical demonstrations of foundry operations. Engineers and metallurgists, as well as foundrymen, took an active part in discussions. R. F. Harrington, Hunt-Spiller Mfg. Co., Boston, headed the committee on arrangements.

Patterns Made in Sections

Pointing out the value of flexibility in pattern equipment, E. M. Phillips, turbine department engineer, General Electric Co., Lynn, Mass., stated that for turbine castings patterns are designed in sections. By designing patterns in this manner, Mr. Phillips declared it was possible to change any given part without greatly changing a pattern as a whole; this minimizes costs and is an aid in peak production periods. The designer should consult with the foundry and pattern shop to attain best results, this procedure often reducing machining operations on the finished casting.

In the design of some patterns, it is necessary to designate the type of iron to be poured. Mr. Phillips illustrated this by indicating some cast irons with alloys of scrap mixture for higher strength material. Turbine castings also must be planned to withstand internal pressures and temperatures. Temperature control in pouring and accuracy in the use of sand and other materials also is important.

Dean Smalley, engineering department, General Electric Co., Lynn, Mass., cited examples of reductions in costs by advantageous changes in pattern design through co-operation between pattern shop and foundry. Savings of $20,000 annually are attained by one foundry through such co-operation.

Charles F. Miller, Fairmont Foundry, Woonsocket, R. I., declared the great variety of castings makes such inter-departmental collaboration imperative. E. L. Bartholomew, metallurgist, United Shoe Machinery Corp., Beverly, Mass., contended the possibilities in heat treating and metallurgy in gray iron production had hardly been touched, both having lagged far behind progress in steel. For reduction of weight and greater strength, the metallurgist should be consulted in the design of patterns.

Around the subject of high-tensile cast iron, a warm debate developed. E. H. Ballard, General Electric Co., Lynn, Mass., stated that while iron foundries are able to produce 100,000-pound strength castings, progress has lagged behind steel, aluminum and other materials. The question of such high tensile iron being commercially desirable at this time was debated.

V. T. Malcolm, metallurgist, Chapman Valve Mfg. Co., Indian Orchard, Mass., contributed a paper on steel casting design in which he declared that high-test iron requires detailed care in designing patterns. He agreed with Mr. Harrington that while high-test iron has a place commercially and is available, foundrymen should be cautious in developing the material on a production basis. The matter of wear was stressed by several. Some irons of less tensile strength show better wear for certain specific uses. Presence of graphite is a factor, several agreed. Competition with rolled plates, welding and reduction in number of iron alloys also entered the discussion.

Discusses Bronze Castings

H. J. Roast, vice president, Canadian Bronze Co. Ltd., Montreal, discussing pattern design for bronze castings also stressed co-operation between all foundry departments and the importance of the choice of alloys for special uses. Corrosion and economic factors which may force the use of inferior metals likewise were discussed.

In cupola operation the smallest diameter to fulfill requirements is desirable, according to D. J. Reese, foundry engineer, development and research division, International Nickel Co. Inc., New York. However, in view of 2000 cupola installations in the country annually, future needs should be considered, four to five years being a minimum in planning new installations.

Accessory equipment, especially the blower, is important; also control of the amount of air in the cupola. For every ton of material utilized, Mr. Reese claimed an approximate amount of air goes up the cupola. While not thinking of air in terms of dollars, he declared it imperative to know how much air a foundry is using. A 20 per cent air loss is frequent and in some plants it is sometimes over 50 per cent. Measuring equipment is partly nullified, however, by leaky connections and inferior piping. The pressure gage too often is not given the attention deserved.

Size of coke in relation to diameter of cupola is another factor. Generally speaking, he said, the proper size relationship would be one-twelfth of the diameter. Ideal size scrap is approximately 30 per cent of the cupola diameter. In addition to the size of the material, its weight should also be considered. A cupola as a heat generating unit, rather than a melting unit also is advocated. Temperature and moisture in the air is given too little attention, water in the air accounting in part for variable performance.

Reviews Cast Iron Tests

Prof. J. M. Lessels, Massachusetts Institute of Technology, outlined a series of results in the testing of cast iron which was followed by a laboratory visitation and demonstration at the institute. Sand control and testing, covering molding sand properties and control at atmospheric and elevated temperatures was reviewed by W. G. Reichert, metallurgical engineer, Singer Mfg. Co., Elizabethport, N. J. Various techniques used in foundry sand testing were discussed by E. E. Woodliff, research engineer, Harry W. Dietert Co., Detroit.

Micro examination of cast metals, transverse tests of cast iron and tensile tests of cast iron were demonstrated in the metals processing laboratories. Other demonstrations included tensile strength tests of rolled steel, worked nonferrous metals and cast nonferrous metals; compression tests of low carbon steel and cast iron and fractures of ductile and brittle types; bend tests of cast steel; crystallization experiments; and photoelasticity and fatigue demonstrations.

D. M. Avey, secretary-treasurer, American Foundrymen's association, Chicago; M. Saunders Jr., president, New England Foundrymen's association; Dr. Karl T. Compton, president, Massachusetts Institute of Technology; and Merwin Horn, photographic service of the institute spoke at the dinner meeting.

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POWER DRIVES

Builder Saves Space by Mounting Flexible Coupling on Flywheel

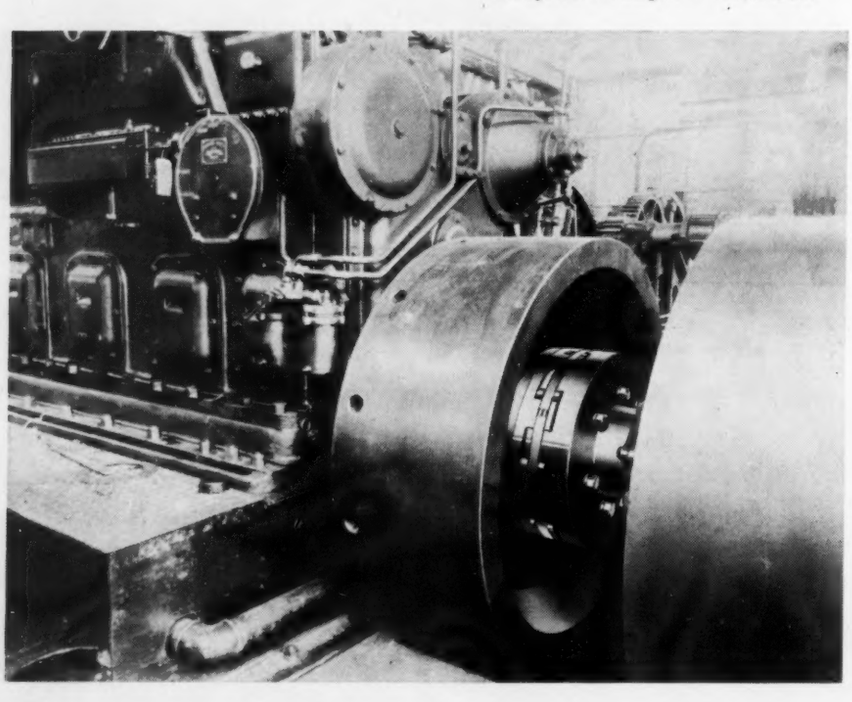
ORDINARILY the use of a flexible coupling requires additional space or length on the shaft. In the installation shown in the accompanying illustration this distance was decreased about 10 inches by special construction with a corresponding saving in frame and length of shaft where space is an important item. In many cases of compact installations a similar method of application would have corresponding advantages.

In this case the flange half of the flexible coupling is bolted on the inside of the flywheel of a diesel engine driving a 12-yard walking excavator. As a result the extreme outside end of the coupling is only 6 inches from the face of the flywheel thus permitting a reduction of 10 inches in shaft length, which is most desirable in this type of equipment. The coupling is connected to the large clutch shown in the lower right-hand corner of the illustration.

This coupling has removable jaws. On the hub end of the coupling the jaw ring is held in place by six capscrews and driven by six 1⅛-inch nickel steel dowel pins. By removing the capscrews the jaw ring is drawn back over the hub of the coupling and the engine is free to revolve independently for setting, timing, etc. The coupling transmits 324,000 inch-pounds at 270 revolutions per minute.

The individual load cushions or flexible elements float freely between jaws and are held in position by hub and removable spiral spring retainers. These load cushions, which prevent metal-to-metal contact between the jaws, are easily removed and replaced in a few minutes when necessary. A standard brakelining material called Metalflex, which is vulcanized under pressure and designed for heavy fluctuating loads, is used as the load cushion.

BOLTING the Lovejoy L-R flexible coupling with removable jaws to the flywheel saved 10 inches of shaft length on this installation of a Fairbanks-Morse diesel driving a Bucyrus-Monighan excavator



♦ ♦ ♦

Switch and panel cabinets are not intended for storage or to take the place of a locker.

♦ ♦ ♦

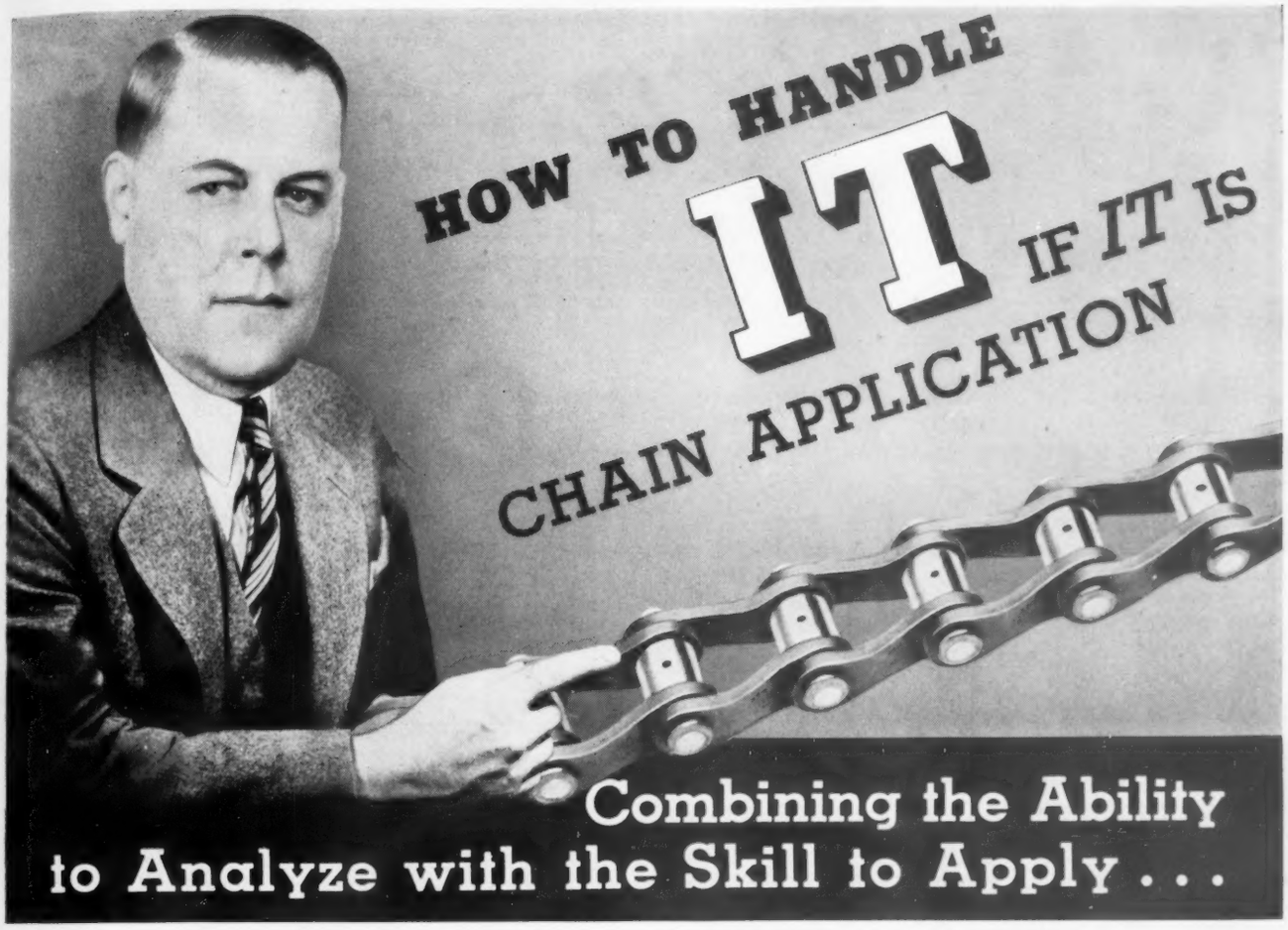
In building a support for a lineshaft, some green timbers were used. Later as the timbers dried out the entire installation was thrown out of line.

♦ ♦ ♦

If motors or other equipment removed from service are worth keeping they are worth protecting from dust and moisture so that they can be quickly put in service again without going into the shop for overhauling.

♦ ♦ ♦

In estimating compressor requirements consider both maximum and minimum demands. A large compressor cannot be operated economically for ordinary overtime demands. One plant found it economical to install an auxiliary 6 x 6-inch compressor driven by a 7½-horsepower motor for such supplementary service instead of using the large compressor driven by a 50-horsepower synchronous motor. Sometimes a unit supplanted because it is too small may be retained for such service.



● A heavy machinery manufacturer, when designing a final drive selected a roller chain with a 120,000 lb. ultimate strength. This seemed to him to be the proper chain to combine with the transmission.

On analysis of the problem, however, the Rex Engineers showed that a Rex Chain, having 180,000 lb. ultimate strength, made of special alloy steels, was necessary to handle the power load—and without over-chaining.

It was decided to make trial units on the latter basis and send them into the field. These have proved to be completely satisfactory. The Rex Engineers' recommendation became the standard specification.

A major part of the function of the Rex Chain Engineers working with your designers and engineers is in the analysis of chain drive problems. Their wide experience enables them to apply chains that meet field conditions.

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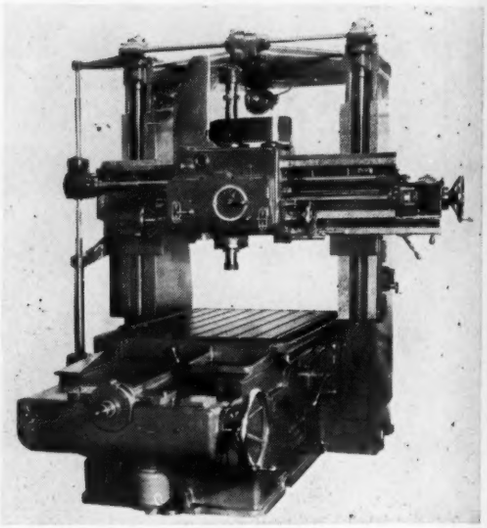
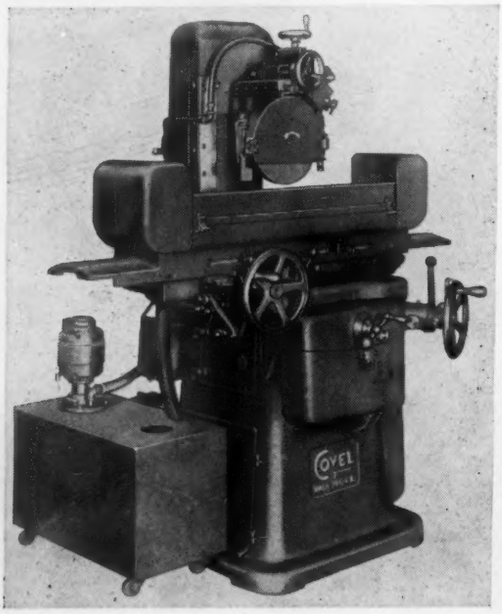
NEW EQUIPMENT

Jig Boring Machine—

Cleveland Universal Jig Co., 13404 St. Clair avenue, Cleveland, has recently designed and built a new precision jig boring machine. The machine incorporates a substantial base, a table of ample size, rigid uprights for carrying the crossrail, a crossrail and spindle saddle. Base is of box type design ribbed to eliminate vibration and provided with one flat and one V-way on which the table travels. Table longitudinal screw is fitted with a 6-inch dial graduated to thousands of an inch, and to facilitate closer settings this dial is equipped with a vernier. Accuracy of settings made with the dial and vernier are governed by the accuracy of the screw itself. To provide further accuracy a vernier slide runs the entire length of the table and by means of this slide it is possible to make settings with great accuracy so that holes spaced by means of this vernier will be within a small fraction of a thousandth of an inch to the predetermined dimension. Table screw is driven by a ½-horsepower motor and table movement is controlled by a conveniently located switch. Crossrail is fitted with a traverse screw provided with a micrometer dial fitted with a vernier, while also a vernier slide is provided to facilitate making correct cross settings. Spindle saddle is fed across the crossrail by a ½-horsepower motor provided with a push button control, and hand control wheels also are provided for table, saddle and spindle movements. Spindle is driven by a 7½-horsepower variable speed motor through a shaft at the side of the left-hand housing through the crossrail shaft to the spindle housing shaft. Power is transmitted to the spindle through four V-belts at high speed, lower speeds being transmitted through worm gears. Spindle is of alloy steel operating in precision ball bearings.



Precision jig boring machine newly designed by Cleveland Universal Jig Co.



New Covel No. 5 surface grinder which operates at a table speed ranging from 10 to 90 feet per minute

• • •

Surface Grinder—

Covel Mfg. Co., Benton Harbor, Mich., has recently placed on the market its new No. 5 surface grinder. Table speed on this machine varies from 10 to 90 feet per minute. The cartridge-type direct motor-driven spindle runs in precision ball bearings. It is supported by a heavy head to eliminate vibration. Spindle and rotor are balanced as a unit, and a double-elevating screw mechanism affords extreme accuracy in vertical movement of the

★ ★ ★ ★

AND NOW!

The "NoPlug" Controller

PATENT APPLIED FOR

AGAIN BAKER SETS THE PACE WITH A 4-STAR FEATURE

THE "NoPlug" CONTROLLER . .

- . . . affords positive protection of drive mechanism
- . . . prevents abuse of motor, controller, batteries, tires and entire running gear
- . . . minimizes repair and maintenance costs
- . . . is standard on all new Baker Trucks

and

- . . . can be installed on all Bakers now in service.

The biggest slice of the repair and maintenance dollar on electric industrial trucks has always been traceable to the ability of truck-operators to shift instantly from full-speed-forward to full-speed-reverse (and vice versa)—a constant temptation and a constant threat to motors and driving mechanisms.

"PLUGGING" ELIMINATED

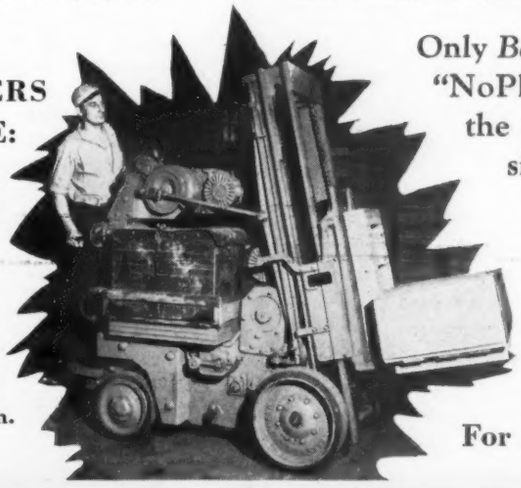
With the Baker "NoPlug" Controller, "plugging" is impossible . . . careful operation COMPULSORY. When the "NoPlug" is thrown from forward to reverse (or vice versa), nothing happens . . . no power is applied. The operator must bring the truck to an almost complete stop before power takes effect in the opposite direction. A definite interval in first speed is compulsory, insuring most effective and efficient use of current and insuring faster get-away.

LOWER MAINTENANCE COST ASSURED

Only *Baker* Trucks give you the protection of "NoPlug" Control. In combination with the Baker Duplex Compensating Suspension, (also exclusive), which cushions shock and eliminates strain between axles and frame, the "NoPlug" puts Baker Trucks far out in front in durability, low maintenance cost and uninterrupted operation.

BAKER OWNERS PLEASE NOTE:

The demand for "NoPlug" Controllers for replacement use is already taxing our production capacity. Orders are being filled strictly on a first-come, first-served basis. To avoid delay and disappointment later we recommend early action.



For complete details write, wire or phone

Baker

BAKER INDUSTRIAL TRUCK DIVISION
of THE BAKER-RAULANG COMPANY
2167 West 25th Street • Cleveland, Ohio

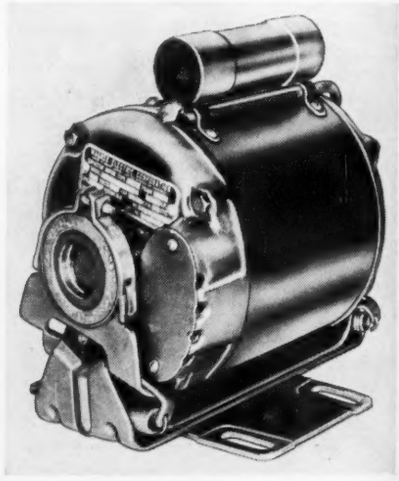
The most economical way to handle material is NOT to HANDle it

grinding wheel, it is claimed. Elevating screws and nuts as well as vertical slides are completely enclosed by telescoping guards to protect against abrasive dust. Controls are easily reached from the operating position, the elevating handwheel being placed at the working level of machine at the operator's right. Ball bearing throttle valve expedites changes in table speed, and the hydraulic pump is V-belt driven by a 2-horsepower motor. The wheel-truing device, which is optional, can be built into the head. Power may be stopped quickly by push buttons at the operator's fingertips, and the relief valve in the hydraulic system automatically stops feed should work become jammed.

♦ ♦ ♦

Resilient-Mounted Motors—

Wagner Electric Corp., 6391 Plymouth avenue, St. Louis, has recently placed on the market a new small capacity line of annular-type resilient-mounted motors. These motors are available in sizes ranging from ⅛ to 1 horsepower. Annual resilient mountings are now available on repulsion-start-induction, split-phase, capacitor and polyphase types of Wagner motors. Motor base is made of rolled sheet steel and is shaped in the form of a cradle for supporting the motor. Large rings of rubber which support the motor are vulcanized to inner and outer steel rings, affording padded resistance against vibration. The motor is locked into place in cradle-arms by means of latches and latch-nuts, and the motor can easily be removed from the base by loosening the latch-nuts and removing the latches. These motors are also available with belt-tightener bases. They are so designed that the belt tension increases with the load, preventing belt slippage and reducing belt and bearing wear.

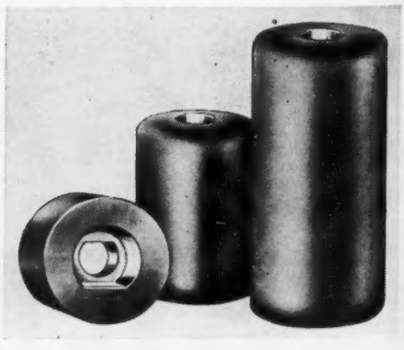


Resilient mounting is a feature of the new line of motors recently introduced by Wagner Electric Corp.

♦ ♦ ♦

Flexible Coupling—

Henry Engineering Co., 7401 Sangamon street, Chicago, has recently announced a new line of flexible couplings molded of soft live rubber to absorb shock and vibration. Flat spots are molded into the ends of the couplings to fit securely over flats of shafts, thus eliminating set



Henry flexible couplings molded of live rubber are built to fit over flat spots on the shaft

PERKINS MAN COOLER

Trade Mark Reg. U. S. Pat. Off.

PERKINS MAN COOLERS, recognized as the most efficient appliance for bringing comfort to workers in hot places, are proving a vital factor in production. They are keeping men comfortably at work in the hottest places, reducing labor turnover, speeding production.

Made in OSCILLATING and STATIONARY types, (both portable).

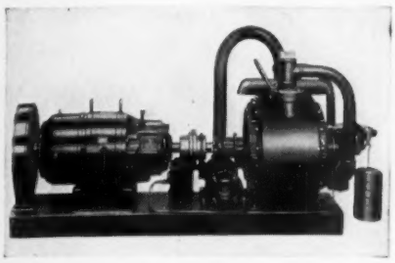
B. F. PERKINS & SON, Inc. HOLYOKE, MASS.

screws. Elimination of metal parts gives full flexibility throughout the entire length of the coupling, according to claims. The light weight of these couplings will not throw small rotors out of balance. Endwise movement for allowing rotors to find their correct centers can be controlled by lengths of flats on shafts or by depths of pockets in the coupling. Sizes of couplings range from 1¼ to 4¼ inches.

♦ ♦ ♦

Gas Booster—

Lammert & Mann Co., 221 North Wood street, Chicago, has developed a new type air-cooled gas booster designed for heavy duty continuous work. A special compensator provides for steady pressure at high or low load. When the discharge of the compressor is reduced, the motor is automatically unloaded pro-



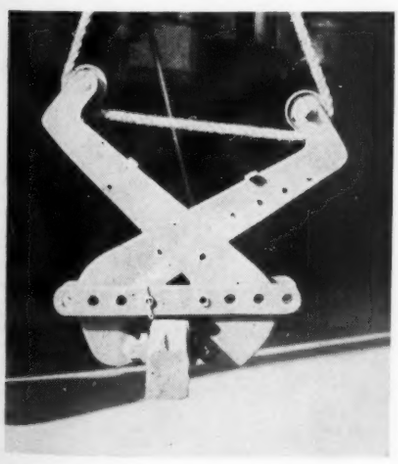
Designed by Lammert & Mann for continuous heavy duty operation, this gas booster is air cooled

portionately which reduces power cost. This booster is adapted for portable use since no foundation is required. Forced-feed lubrication is used, and the booster is furnished with a separator that separates oil from the gas.

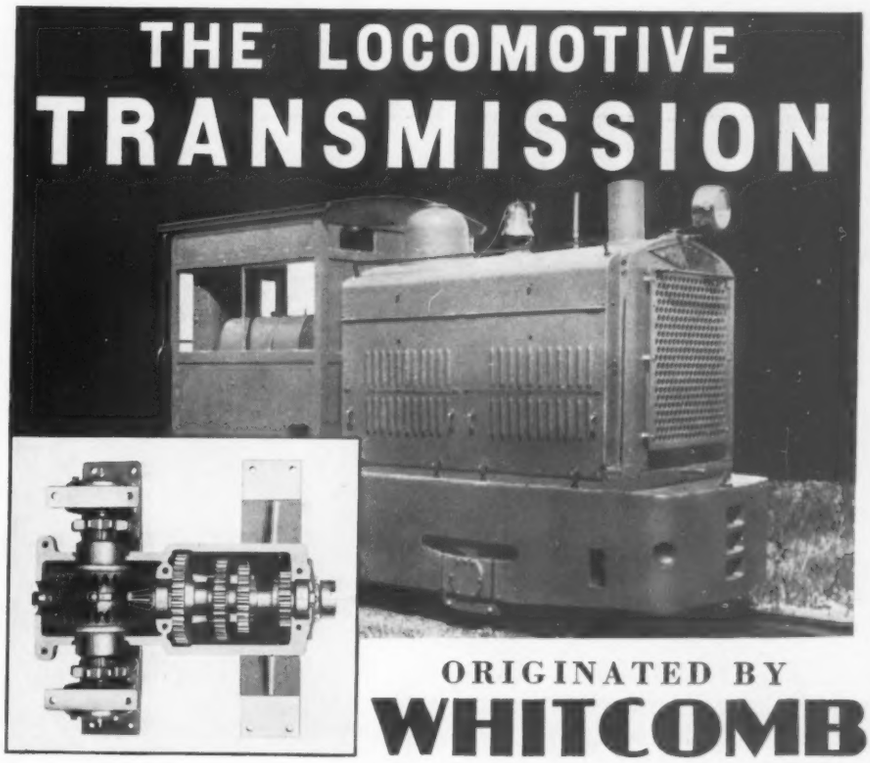
♦ ♦ ♦

Grips—

Smith Devices, 2245 North Twelfth street, Philadelphia, has recently placed on the market three new types of grips. The first is a heavy duty forging grip designed for holding heavy pieces of steel under the hammer and similar uses. The jaws are controlled by a worm mechanism which enables the operator to stand some distance back of the furnace. The grip is suspended from a chain and is so balanced that the energy required to operate it is at a minimum. The second device, which is a light type forging grip, is operated on the same principle as the heavy duty type. It has an extended tube handle, with handles at right angles so the operator has perfect control under practically all conditions. It has proven very difficult to jar a piece of steel loose from the grip of this device. Both light and heavy duty type grips are made of alloy steel to withstand considerable strain. The third type of grip is so designed that the grip may be landed on a load or taken off with a crane without the operator actually touching the device. A chain or small rod is provided for pulling the latch which releases or locks the jaws. The grip is adjustable to take a large range of sizes. The grip shown in the accompanying illustration has a range of sizes from 1½ to 20 inches and is shown in a closed



Grip designed by Smith Devices which is operated by the craneman without aid from men on the floor



ORIGINATED BY
WHITCOMB

● An important part of a locomotive is the transmission. It gears the power to the load, and must be strong enough to carry the full engine torque at rated speeds.

● The standard Whitcomb, selective-gear type transmission, providing four speeds in either direction, was originally designed by The Whitcomb Company, and has been accepted as the standard design for all heavy-duty, internal-combustion locomotives. It delivers a larger proportion of the engine power to the rails and contributes to economical operation.

● In larger sizes, the gears are constantly in mesh. Engagement is effected by stepped jaws in the faces of gear hubs. All gears, sprockets and shafting are alloy steel. The heavy-duty roller chains are made of alloy steel. Shims in journal boxes provide for take-up. Bearings are heavy-duty ball or roller type.

A SIZE AND TYPE TO SUIT YOUR NEEDS

Gasoline or Diesel Mechanical Drive — Gasoline or Diesel Electric Drive
Electric Storage Battery
Electric Trolley — Combination Trolley—Storage Battery

Whitcomb Engineers will survey your requirements and estimate the savings you can make by investing in Whitcomb equipment.

THE WHITCOMB LOCOMOTIVE COMPANY
Subsidiary of The Baldwin Locomotive Works
Plant at Rochelle, Illinois. All sales made by The Baldwin Locomotive Works, Paschall Station Post Office, Philadelphia, Pennsylvania.

WHITCOMB LOCOMOTIVES

position ready for picking up a thin piece of metal.

♦ ♦ ♦

Ball Bearings—

Fafnir Bearing Co., New Britain, Conn., has recently introduced a new bearing built primarily for use in high-speed grinding equipment where shaft speeds range from 5000 to 40,000 revolutions per minute. This bearing, to be known as the X Type, is furnished in nine sizes ranging from 12 to 45 millimeters bore. Permissible tolerances on these bearings are 0.0001-inch on the bore and 0.0002-inch on the outside diameter. The bearings are preloaded at the time of assembly and supplied with light retainers, which are claimed to be the most satisfactory in high speed service.

♦ ♦ ♦

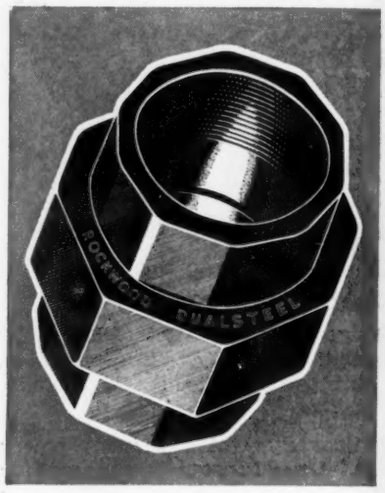
Gage Blocks—

Johansson Division, Ford Motor Co., Dearborn, Mich., announces the introduction of a new No. 2 set of precision gage blocks at a price somewhat less than the cost of the present No. 2 sets. The new set is the same as the present set with the exception of four accessory items—two jaws and two adjustable holders. Blocks are of B, A and AA qualities, accurate to within plus or minus eight, four and two millionths of an inch. The 35 blocks comprising the new set provide 80,000 different size measurements in steps of 1/10,000-inch.

♦ ♦ ♦

Steel Union—

Rockwood Sprinkler Co., 38 Harlow street, Worcester, Mass., has recently introduced a new high strength steel union recommended for operation in pipe lines under 600 pounds working steam pressure, 2000 pounds hydrostatic pressure or 900 degrees Fahr. The new union, which is to be known as Dualsteel, possesses greater tensile strength, hardness and resistance to corrosion, according to its makers. The union is completely Parkerized, including all the threaded areas, and sells off the standard black list. Sizes from ¼ to 2-inch are available.

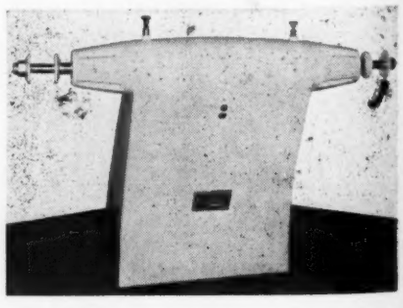


Rockwood dualsteel union designed for operation in pipelines under extreme conditions

♦ ♦ ♦

Polishing and Buffing Lathes—

Wm. V. Robinson Co., Owosso, Mich., is introducing a new line of



Robinson polishing and buffing lathe built for continuous heavy duty service

THOMAS

FABRICATING MACHINERY

for

Structural Shops • Shipyards
Tank Shops • Steel Car Shops
Boiler Shops • Railroad Shops

PUNCHES — SHEARS
MULTIPLE DRILLS — SPACING TABLES — DUPLICATORS — BENDING AND STRAIGHTENING MACHINES
ANGLE BENDERS — ANGLE PLANERS
PLATE PLANERS — BENDING ROLLS
STRAIGHTENING ROLLS — FACING MACHINES — PRESSES

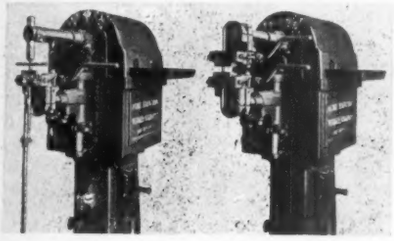
THOMAS SPACING MACHINE CO.
PITTSBURGH, PA.

polishing and buffing lathes. These machines are built for heavy duty, hard continuous service, and are equipped with extra heavy spindles and large dust sealed ball bearings. The two spindles are independent but are connected together and are driven by one motor. With this arrangement it is relatively easy to change the V-belts by separating the spindles. The lathe is designed with sufficient overhang to clear the operator's feet and the spindles are out far enough from the base so that large or bulky pieces may be buffed or polished without interference from the machine itself.

♦ ♦ ♦

Welding Attachment—

Acme Electric Welder Co., 5621 Pacific boulevard, Huntington Park, Calif., has recently announced a new and improved Tee-welding attachment for spot welding machines. The machine is now supplied on special order to fit spot welder horns that are 2¼ or 2½ inches in diameter. The height stop is now cadmium plated and the leg on the height stop is now made of bronze. The striker plate for the cam was formerly made of hardened steel in square shape retained in position by four screws. This is now made in the shape of a circular hardened steel disc, which can be revolved as wear takes places and also reversed, providing for almost indefinite life.

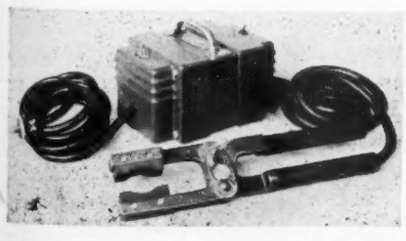


Acme Electric Welder Co. announces an improved Tee-welding attachment for spot welders

♦ ♦ ♦

Electric Pliers—

Ideal Commutator Dresser Co., 1934 Park avenue, Sycamore, Ill., has developed a new No. 10 electric pliers with heated jaws designed for soldering lugs up to 1050 amperes or sweating pipe fittings up to 2½ inches in diameter under continuous operation. When used only intermittently, the No. 10 pliers will handle pipe or fittings up to 4 inches in diameter. Advantages of these pliers over other soldering tools, according to the company, are that they sweat joints without unsweating adjacent connections, hold work firmly while soldering, heat the work evenly from both sides and eliminate open flame hazards. Line current from which this tool operates is reduced to a harmless low voltage to minimize danger from electric shock to the operator.



Large pipe and other heavy materials are sweated or soldered in this oversize model heated jaw pliers

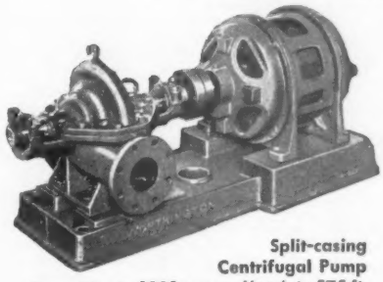
♦ ♦ ♦

Dust Collector—

Jabez Burns & Sons Inc., eleventh avenue and forty-third street, New York, has recently placed on the market a new dust collector known as the Keenan cyclone. The unit has been designed for collecting industrial dust with a minimum of back pressure and power loss. Dust is removed from the air by whirling the air stream in a cylinder having a tangential inlet and a central outlet at the top. The cyclones may be

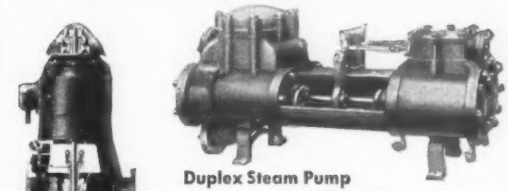
WORTHINGTON

THE MOST COMPLETE LINE OF PUMPS
... a size and type for every job

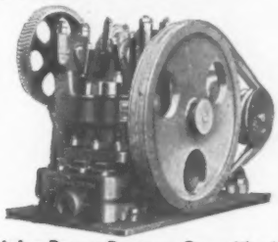


Split-casing Centrifugal Pump
Capacities to 3000 g.p.m. Heads to 575 ft.

Monobloc Centrifugal Pump... Capacities to 1100 g.p.m. Heads to 280 ft.

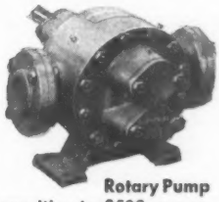


Duplex Steam Pump
Capacities to 420 g.p.m.
Pressures to 350 lb./sq. in.

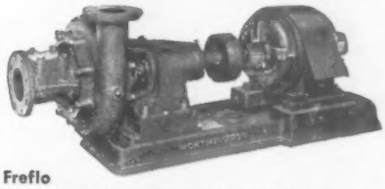


Triplex Power Pump... Capacities to 50 g.p.m. Pressures to 250 lb./sq. in.

Turbine Deep Well Pump
Capacities to 6000 g.p.m.
Heads to 600 ft.



Rotary Pump
Capacities to 2500 g.p.m.
Viscosities to 500,000 S.S.U.



Freflo
Centrifugal Pump for liquids containing solids
Capacities to 7500 g.p.m. Heads to 135 ft.

THESE pumps are representative of a comprehensive line... from which the proper selection to meet any individual condition can be made, without prejudice or compromise.

Every unit is expertly engineered, embodying modern features proved in service... and is built to exacting standards.

There is a Worthington Dealer or District Office near you

● Literature available

IC7-8A

WORTHINGTON PUMP AND MACHINERY CORPORATION
General Offices
HARRISON, NEW JERSEY

built in any size, depending on the service for which the consumer intends the unit.

♦ ♦ ♦

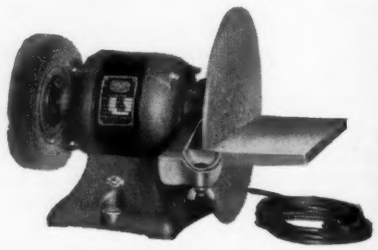
Industrial Reflector—

Day-Brite Reflector Co., 5401 Bulwer avenue, St. Louis, has recently introduced a new industrial reflector to be known as the "Super-Lume." These reflectors are available in sizes to fit incandescent lamps of varying wattage or mercury vapor lamps. Models for stack illumination, ceiling reflection or standard outlet box installations are available. Adjustable straps on one model provides for use of either 150 or 200-watt bulbs at maximum efficiency.

♦ ♦ ♦

Disk Grinder—

Chelsea Fan & Blower Co., 370 West 15 street, New York, has recently placed on the market a new disk grinder which operates at 1750 revolutions per minute and carries a 12-inch disk. Standard equipment on this new machine includes the 12-inch disk faced with No. 50 Aloxite cloth, a hinged table, a 10-foot length of extension cord and plug. The motor is a 1/3-horsepower enclosed unit equipped with ball bearings. The grinder is available for operation on any specified voltage and 50 or 60 cycles. The table is 8 by 12 inches and is mounted on a pair of swivel sockets for setting square or at an angle with the face of the disk. Separate disks and tables are available to convert the machine to a double-disk unit.

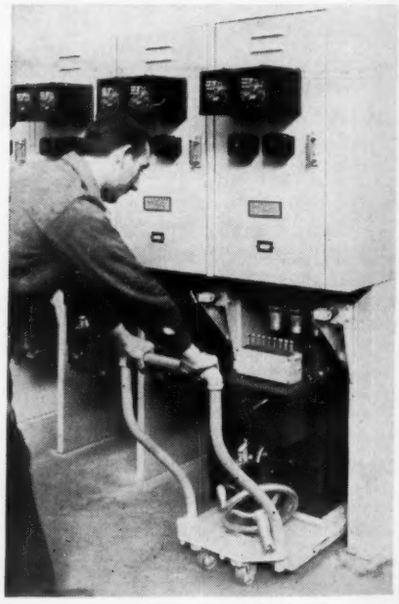


Chelsea 12-inch disk grinder which operates at a speed of 1750 revolutions per minute

♦ ♦ ♦

Metal Clad Switchgear—

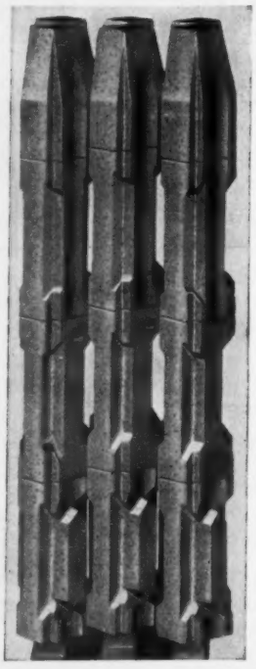
Delta-Star Electric Co., 2400 Block, Fulton street, Chicago, has recently completed a new 50,000 kilovolt-ampere metal clad switchgear in which the oil circuit breaker can be completely disconnected from the bus and line, removed and replaced if desired by a similar breaker. The lifting and lowering device in the stationary element is a self-contained mechanism which automatically places the oil circuit breaker in correct position to engage both primary and secondary disconnectors.



Removing the oil circuit breaker from one of the new Delta Star metalclad switchgears

Bailey...
WMB Co. EQUIPMENT

THE AMERICAN
OPEN JOINT STOVE CHECKER
FOR BLAST FURNACE STOVES



Present trends toward larger blast furnace capacity demand additional stove capacity or increased efficiency of existing stoves.

American Open Joint Stove Checkers, replacing conventional checker brick have proved their ability to furnish sufficient heating surface for the 1,000 Ton Blast Furnace with three instead of four stoves operating.

Material saving in gas plus the capital investment saved in one entire stove and its auxiliary equipment warrants immediate investigation of American Open Joint Stove Checkers for your blast furnaces.

WILLIAM M. BAILEY COMPANY
Engineers
MAGEE BLDG. PITTSBURGH, PA.
European Agents—Ashmore, Benson, Pease & Co. Ltd., Stockton-on-Tees, England

Open-Hearth Operators Discuss Problems

(*Concluded from Page 62*)

high-carbon rimmed bottom poured ingots.

Various types of mold coatings are used in the steel industry. At one shop where salt dipping is practiced, 100 pounds of this material is added after each drag of molds is treated. Another shop has been using this type of dip for 1½ years, molds being treated at a temperature of 500 degrees Fahr. At another shop both tar and graphite are employed for coating the molds when they are at a temperature ranging from 350 to 400 degrees Fahr. If the molds are hotter than this range they first are dipped in cold water and then coated. One open-hearth operator emphasized that the use of the tar spray with controlled temperature of molds gives the best results. He designated 300 degrees Fahr. as the proper temperature for securing a hard baked finish.

Mold coating at a Pennsylvania plant differs somewhat from practice at other shops. Soot from the gas producers is mixed with molasses in a ball mill and into this solution all molds are dipped. Results with this coating are reported as highly satisfactory. One producer obtained a 6 per cent increase in yield as a result of using salt dip.

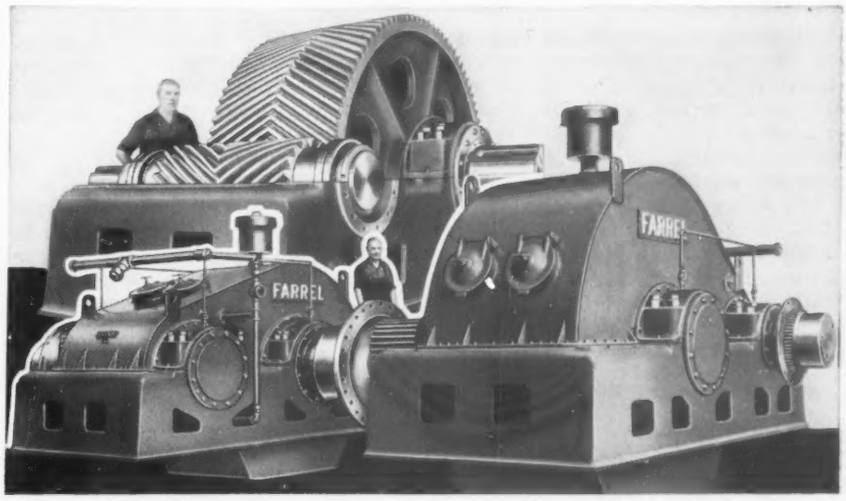
Accidents are a form of economic waste which increase the cost of production stated a steel plant official in discussing safety and training in the open-hearth. Progress in safety, he pointed out, depends on the company setting up a procedure and the responsibility for carrying out this procedure depends on management and leadership.

In discussing methods used for weighing scrap buggies one steelworks executive mentioned that he was putting in a 10-bank adding machine for this purpose. The first two rows of keys are to be used for recording the buggy number, the other two rows draft and those in between for recording the net weight. Striking the total will give the entire weight.

In discussing the use of various metals in grain size control the speaker stated that it takes two times the quantity of zirconium to obtain the same grain size as aluminum. In evaluating vanadium he stated that this element only has one-half the strength of aluminum for controlling the grain size. Other open-hearth operators felt that pig iron is not the controlling factor in grain size. It was brought out that time and deoxidation were the elements of most importance in this connection.

Recognizes Need for Ore Concentration

BENEFICIATION of low-grade ores is widely practiced on the Mesabi range, and to a lesser extent on the Cuyuna. On the old ranges in Michigan, the need for concentration is just beginning to be recognized, and a study of possible methods has only recently been started. These facts were brought out by T. B. Counselman, manager, Chicago industrial division, Dorr Co. Inc., Chicago, at the opening session of the Blast Furnace and Raw Materials committee of the American Institute of Mining and Metallurgical Engineers which held its first



PRECISION *and* STRENGTH *for* HEAVY DUTY SERVICE

Smooth, quiet operation is as essential in large mill drives as in smaller machines. High speeds and heavy loads subject the drive units to stresses and shocks which are successfully withstood only if the drives are properly designed for such service and built to high standards of accuracy.

The drives illustrated above are typical of the advanced engineering and precision manufacture of Farrel-Sykes Gear Units. The one at the left is a 4,000 H. P. drive for a 72" Four-High Reversing Cold Strip Finishing Mill and the unit at the right is a 1500 H. P. drive for the reel of the same mill. Inset shows the 1500 H. P. reel drive with its cover removed.

Both are single reduction units with cases of all-welded steel construction which have greater strength with less weight. The continuous tooth herringbone gears are accurately generated by the Sykes process. The gears are lubricated by built-in sprays and the bearings are flood lubricated, oil being supplied to both gears and bearings by a central lubricating system. The breathers mounted on the cover prevent oil contamination by trapping dirt and moisture.

Farrel-Sykes Gears and Gear Units are made in any capacity up to 10,000 H. P. for every type of industrial service. They are engineered to fit the job. When you have a drive problem send for a Farrel engineer.

FARREL-BIRMINGHAM
Company, Inc.

110 Main St., Ansonia, Conn. 322 Vulcan St., Buffalo, N. Y.

joint meeting with the Open Hearth committee of the A.I.M.E. at Hotel Tutwiler, Birmingham, Ala., April 7-9.

Over 150 members and guests of the Blast Furnace and Raw Materials committee were registered. Plans now are being formulated for another joint meeting of the two committees in Buffalo next April at a date to be announced later.

One feature is universal with Mesabi range wash ores. The large lumps are invariably unaltered taconite. In general, everything over 6 or 8 inches is screened out and sent to the lean ore dump. Of late years it has become necessary to crush the ore, generally to about 1 inch, to free sand grains trapped in vugs or recesses in the ore lumps.

In considering the washing of iron ores, Mr. Counselman directed attention to the fact that the blast furnaces must be operated on a uniform charge, with the same slag volume, same ratio of coke and limestone, etc. Therefore, the grade of ore shipped must be kept uniform.

Another factor of importance mentioned by the speaker is that the furnace does not want more than 10 per cent by weight of material finer than 100 mesh. Many of the "Merch" ores over-run this percentage. Therefore, the washed concentrates are kept down to about 5 per cent minus 100 mesh, and blended with the fine "Merch" ores, to give the desired structure.

As leaner ores have come to be treated, resort has been made to jigging. Jigging, he stated, is practiced where there are lumps of 1¼ inches and smaller present which are too low grade to be shipped direct. Future trends in practice point to more jigging than at present.

There is in operation today a magnetic roasting furnace, treating accumulated jig tailing on which the stripping, mining and most of the crushing costs have been written off. After magnetic roasting, he explained, the high-grade lumps are picked out by magnetic drum cobbers, and magnetic logwashers. An average weight recovery of about 60 per cent has been obtained on material previously discarded as jig tailing and put on the lean ore dump.

Sintering Costs Are Higher

Mr. Counselman stated that sintering at the head of the lakes is much more expensive than at the blast furnace, and can only be justified by freight savings, or by converting an ore which is unsalable because of low natural iron, to a marketable product.

At the Evergreen mine there is probably the largest sintering machine in the country, it having a capacity of 1500 tons per day.

The speaker announced that an interesting operation is being carried out at this property. The ore is screened at about ⅜-inch, and the fines sintered for the dual purpose of eliminating water, both free and combined, and for agglomerating the fine particles. The oversize of the ⅜-inch screens, still contains considerable moisture. It is loaded into cars simultaneously with the red hot sinter, the heat from which eliminates a large part of the moisture from the oversize and gives a product of suitable shipping grade.

In speaking on "Ore Mining on Red Mountain," T. C. DeSollar, superintendent of mines, Woodward Iron Co., Birmingham, Ala., mentioned that an estimate of 1,500,000,000 tons of iron ore still is available for mining in Alabama and that only 200,000,000 tons of ore has been mined in the state in the past 77 years.

An abstract of a paper on "Raw Coal in Blast Furnaces" by W. T. Allan, chief chemist, Shotts Iron Co. Ltd., Edinburgh, Scotland, was presented by Ralph Sweetser, New York. Coal-smelted pig iron differs from coke-smelted iron. The tarry vapors, the speaker explained, impregnate the ore during its descent of the furnace shaft, condense upon the surface and within the pores of the ore and later, as the ore reaches the hotter regions of the furnace, the deposited tar is subjected to distillation, leaving a residue of coke upon and within the ore.

The stockline level of a coal-fired stack varies from 12 to 14 feet and with normal driving the stock descends at the rate of 1 foot per hour. The furnace usually is cast at 8-hour intervals and the slag flushed three times between casts.

Blast furnace practice in France is determined more or less by the character of the ores used. Some French ores are siliceous, others calcareous, and by proper burdening a self-fluxing mix can be used. This was the contention of F. Clerf, France, whose paper, "Blast Furnace Practice in France," was presented by W. A. Haven, vice president, Arthur G. McKee & Co., Cleveland.

The minette ores in the western part of Lorraine, the speaker explained, are of two classes—siliceous and calcareous. In the furnace these ores are classed as those which explode when heated rapidly and those that do not explode. Smelting results in the production of a large amount of flue dust which builds up on the bosh. A method of overcoming this is to put in a second row of tuyeres to melt away the scaffold and permit the stock to move regularly. One modern plant in France has installed three rows of tuyeres.

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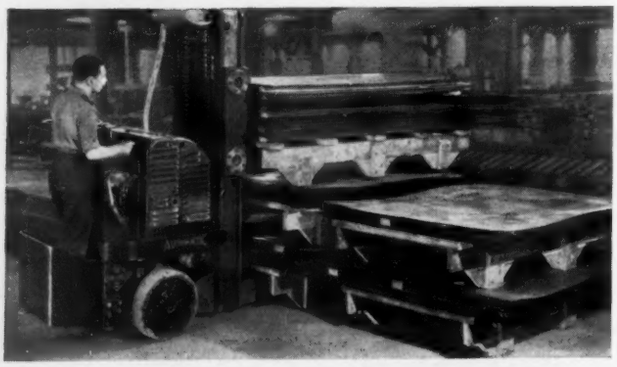

THE READY-POWER COMPANY
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MATERIALS HANDLING

Push Crane and Hoist Used for Pickling Work

(*Concluded from Page* 48)

more, the trolley has reaction wheels mounted in a horizontal plane and bearing against the edge of the runway.

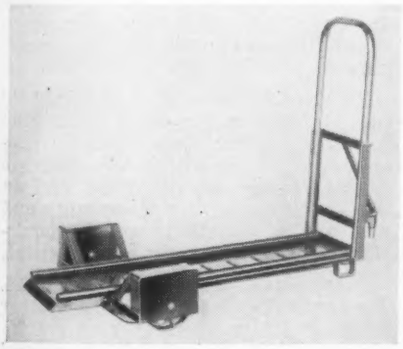
Material to be pickled is transported to the pickling tanks in special cradles on 4-wheel floor trucks, which run in depressed tracks in the floor, as shown in Fig. 2. The cradle is then picked up by the hoist and the latter with its load is propelled by the operator to a position over the first tank, into which the cradle is lowered. The operator has control, within easy arm reach, of all movements of the hoist, and at the same time has a safe position outside the guard rail.

The installations described in this article were made by Robert Abel Inc., materials handling engineer, Boston.

• • •

New Truck Facilitates Handling Wire in Coils

A SPECIAL wire coil handling truck is a recent development of the All Steel Welded Truck Corp., Rockford, Ill. The unit, shown in the accompanying illustration, is 56 inches long overall, 3¼ inches high



This truck was designed to handle wire in coils. Mounted on two wheels, it can be used as a semilive trailer or with lift jacks

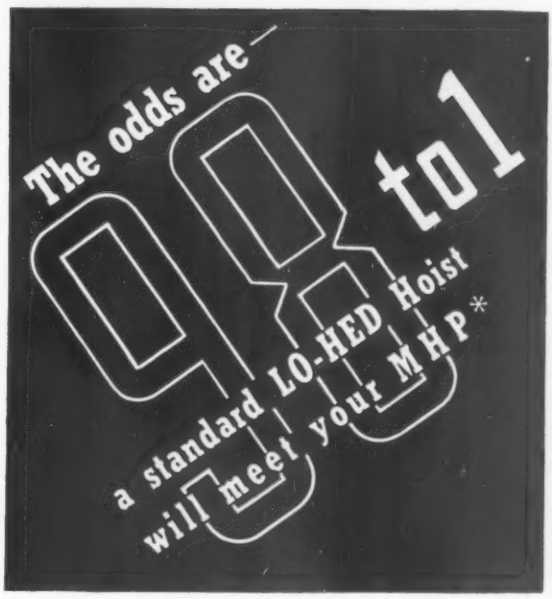
to top of platform, with a clearance of 1¾ inches. Other dimensions are: Height of front bar, 41 inches; width at wheels 30 inches, and width of loading platform 15 inches. Weight is approximately 140 pounds and capacity 2500 pounds. Wheels are 8 inches diameter, equipped with roller bearings, hardened axles and grease fittings. The truck is designed for use as a semilive trailer or in conjunction with lift jacks.

British Societies Hold Joint Motor Symposium

Meeting jointly in London, fourteen British scientific societies heard papers describing research in relation to the motor vehicle. General problems and progress in this field were outlined by C. G. Williams, Director of Research, I.A.E. Research Dept.; fuels and lubrication research was described by F. H. Garner, Anglo-American Oil Co.; and materials with special reference to steel were covered by T. Swinden, United Steel Cos.

In the final paper, Mr. Swinden indicated the trend of development of steels for the more important parts of the car. The three sections have been published in pamphlet form and copies are available from the secretary of the Institution of Automobile Engineers, Watergate House, Adelphi, London, W.C.2.

UNCOVER THE FACTS!



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Announce Program For Enamel Forum

PORCELAIN ENAMEL INSTITUTE announces the program for its forum to be held at the University of Illinois, Urbana, Ill., May 5-7. This meeting, open to everyone in the porcelain enameling and related industries, has been arranged to supplant previous forums and short courses.

A committee consisting of F. E. Hodek Jr., General Porcelain Enameling & Mfg. Co., Chicago, chairman; Dr. A. I. Andrews, University of Illinois, Urbana, Ill.; Prof. R. M. King, Ohio State university, Columbus, O.; and J. E. Hansen, Ferro Enamel Corp., Cleveland, prepared the program.

In the forum, emphasis will be placed upon practical problems. Following the presentation of technical papers, roundtable discussions will be held. The detailed program is as follows:

Wednesday, May 5

AFTERNOON

"Review of Progress in the Industry," by Emerson P. Poste, consulting engineer, Chattanooga, Tenn.

"Some Fundamentals of Porcelain Enamel," by Prof. C. W. Parmelee, University of Illinois, Urbana, Ill.

Thursday, May 6

MORNING

"Symposium on Testing of Enamels," by W. N. Harrison, national bureau of standards, Washington.

"Design and Factors Affecting Hairlining," by E. C. Greenstreet, Standard Gas Equipment Corp., New York.

"Reducing Enamel Ware Shipping Losses," by Howard Wetter, Chicago & North Western railroad, Chicago.

AFTERNOON

"The Institute and the Enameler," by E. L. Lasier, Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

"Milling Practice," by E. C. Aydelotte, Benjamin Electric Mfg. Co., Desplaines, Ill.

"Enamel Shop Housekeeping," by W. H. Pfeiffer, Frigidaire Corp., Dayton, O.

"Factors Which Affect Efficiency of the Spraying Operation," by Wesley G. Martin, A. O. Smith Corp., Milwaukee.

EVENING

Dinner and entertainment.

Friday, May 7

MORNING

"Furnaces," by F. S. Markert, Ferro Enamel Corp., Cleveland.

"Production of One Cover Coat Ware," by Herman Cook, Norge Corp., Detroit.

"Forum Plans for 1938," by F. E. Hodek Jr., General Porcelain Enameling & Mfg. Co., Chicago.

AFTERNOON

Hollow Ware

"Pickle Room Practice," by B. T. Sweely, Chicago Vitreous Enamel Products Co., Chicago.

"Drying and Control of Mottle in Gray Ware Enamel," by E. C. Dexheimer, National Enameling & Stamping Co., Granite City, Ill.

"Hollow Ware Tests—Impact, Quenching and Thermal," by G. H. McIntyre, Ferro Enamel Corp., Cleveland.

Cast Iron

"Foundry Practice," by M. E. Manson, Chicago Vitreous Enamel Product Co., Chicago.

"Preparation of Castings for Enameling," by M. L. Carl, Sloss-Sheffield Steel & Iron Co., Birmingham, Ala.

"Processing of Leadless Cast Iron Enamels," by E. C. Porst, George D. Roper Corp., Rockford, Ill.

Sheet Iron

"Screen Process and Decoration," by E. R. Brauner, Federal Electric Co., Chicago.

"Porcelain Enamel Unit Construction as It Pertains to Refrigerators," by F. L. Michael, General Electric Co., Schenectady, N. Y.

"Black Edging Practice," by J. E. Rosenberg, O. Hommel Co. Inc., Pittsburgh.

RECENT PUBLICATIONS OF MANUFACTURERS

Copies of any of the literature listed below may be obtained by writing directly to the companies involved, or by addressing STEEL, in care of Readers' Service Department, 1213 West Third Street, Cleveland

Flow Meters — Cochrane Corp., Philadelphia. Bulletin No. 2091, discussing the value of steam flow meters with description of installation.

Magnetic Separator—Allied Engineering Co., Cleveland. Circular illustrating its new moisture teller and magnetic separator.

Hoists—Shepard Niles Crane & Hoist Corp., 126 Schuyler avenue, Montour Falls, N. Y. Bulletin No. 126, describing antifriction bearing hoists.

Steel Construction—Pittsburgh-Des Moines Steel Co., 3415 Nevill Island, Pittsburgh, Pa. Bulletin No. 301, describing uses of its construction steels.

Water Treatment—Thwing-Albert Instrument Co., 3336 Lancaster avenue, Philadelphia. Circular, Vol. 2 No. 1, dealing with application of hydrogen ion in industry.

Sprinkler Installation—Rockwood Sprinkler Co., 38 Harlow street, Worcester, Mass. Booklet showing what installation of sprinklers will do in reducing fire insurance cost.

Industrial Truck Control—Automatic Transportation Co., 111 West Eighty-seventh street, Chicago. Bulletin describing new electrical control designed for use on industrial trucks, tractors and cranes.

Chimney Construction—Weber Chimney Co., 332 South Michigan avenue, Chicago. Folder describing a new Weber system reinforced concrete chimney built in Corea, a new high in chimneys.

Automatic Lubrication—Bijur Lubricating Corp., Long Island City, N. Y. Bulletin "D", emphasizes the industrial trend toward centralized, forced feed, automatic lubrication and defines the field of application.

Air Coolers—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Circular No. L20564-A, describing air coolers for cooling air or other gases for turbo generators, synchronous condensers, waterwheel generators and other apparatus.

Industrial Chimneys Rehabilitated—Consolidated Chimney Co., 140 South Dearborn street, Chicago. Folder illustrating and describing how scientific, specialized engineering can safeguard against chimney disaster loss.

Miniature Panel Instruments — Westinghouse Electric & Mfg. Co.; East Pittsburgh, Pa. Catalog section 43-350, dealing with a new line of miniature instruments for all types of industrial and radio applications.

Motor Blowers — Ingersoll-Rand Co., 11 Broadway, New York. Bulletin No. 2161-A, on single-stage, type FS, motor blowers; featuring an illustrated discussion of the theory of centrifugal air compression to pressures up to three pounds.

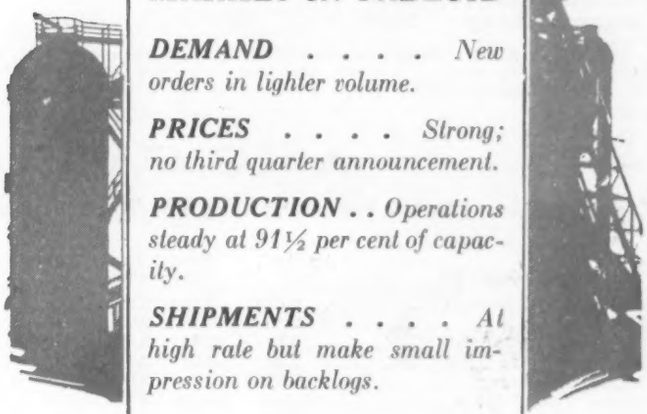
Transmission Belts—United States Rubber Products Inc., 1790 Broadway, New York. Folder containing 25 reproductions of photographs taken in the field and in the factory, showing interesting and unusual installations of transmission belts in a variety of industries.

Alloy Steel—Carpenter Steel Co., Reading, Pa. Folder illustrating methods of production and specifications of its industrial alloy steel for heat treated gears, shafts and other highly stressed parts in automobiles, aircraft, machine, pneumatic and oil drilling tools.

Suspended Magnets — Stearns Magnetic Mfg. Co., Milwaukee, Wis. Bulletin describing various types of safety suspended circular, rectangular, and hand magnets, with illustrations and application data. Folder describing its new type magnetic clutch, called style "E". Bulletin No. 600, describing its new style "DM" magnetically operated brake, includes pictures and specifications.

Production Steady, but New Orders Lighter

Backlogs Still Heavy; Scrap Off Sharply; First Ore Received



MARKET IN TABLOID

DEMAND . . . . *New orders in lighter volume.*

PRICES . . . . *Strong; no third quarter announcement.*

PRODUCTION . . *Operations steady at 91½ per cent of capacity.*

SHIPMENTS . . . . *At high rate but make small impression on backlogs.*

WHILE steel production continues at a high level, new buying is in lighter volume. In spite of smaller inquiry mills have not made much headway in reducing backlogs and continue to restrict bookings to average needs of the buyer. Meanwhile an opportunity is afforded to clarify the situation and put books in better order.

Adjustment of steel and iron scrap prices is proceeding in orderly fashion, STEEL's composite receding last week to $21, a drop of 60 cents from the preceding week, the second downward step. This makes the composite practically the same as for the second week of March. European scrap consuming countries are forming a cartel to handle purchases of scrap for import, in an effort to obtain better prices.

Only slight changes in operating rates at various centers have been made, the net result not affecting the national rate of production, which remains at 91½ per cent. Cleveland increased 2½ points to 76½ per cent, Buffalo two points to 90 and New England two points to 97 per cent. Cincinnati lost four points to 86 per cent and Youngstown one point to 86 per cent. No changes were made in the rate at Pittsburgh at 95, Chicago at 84, Eastern Pennsylvania at 59½, Wheeling at 96, Birmingham at 80, Detroit at 100 and St. Louis at 82.

Announcement of prices on finished steel for third quarter is being sought by consumers but steelmakers are not ready to commit themselves so far ahead, especially with so many uncertain factors existing. At the same time an increasing tonnage is being booked for that delivery at prices prevailing at shipment. This factor may cause third quarter announcements earlier than is usual, perhaps in May. A considerable body of opinion has developed that most prices will be reaffirmed through September.

First cargoes of iron ore reached lower lake ports Saturday, April 17, from Lake Michigan ports. This is unusually early for this movement. A large fleet has been passing into Lake Superior to load at the head of the lakes and deliveries will be made on the lower lakes within a few days.

Railroads continue to support the market by large equipment orders. The Southern Railway has placed 5600 freight cars for its subsidiary, Cincinnati, New Orleans & Texas. Chicago, Milwaukee, St. Paul & Pacific will build 2022 cars in its own shops and the Pennsylvania 300 cars and 11 electric locomotives. The St. Louis & San Francisco has awarded 16 locomotives to its own shops. These car orders bring the total for April to date within less than 300 cars of the 8155 bought in March.

Foreign consumers of pig iron continue to look to this country for additional tonnage and total export inquiry is estimated conservatively at 125,000 tons. Two inquiries for foundry grades call for 70,000 and 40,000 tons and there are smaller lots of other grades. Producers find it difficult to meet delivery requirements of this business, as much tonnage is desired within a few weeks.

Beehive coke has been advanced 50 cents per ton and producers are hard pressed to find sufficient capacity. Coal mines not worked for years are being opened to supply some rejuvenated ovens.

Settlement of the Chrysler strike and partial resumption of production brought a gain in automobile output to 124,970 units last week, 15,765 more than the preceding week. General Motors accounted for 52,155, Ford for 34,850 and Chrysler for 22,200.

Cables from London tell of Great Britain setting a new alltime high monthly total for steel production in March at 1,109,500 tons. This is the fifth month since last September that British steel output has been more than 1,000,000 a month. The daily rate in February and March was steady at close to 41,500 tons.

Shipments of finished steel by the Steel corporation in March reached 1,414,399 tons, the largest March tonnage since 1929. For first quarter Corporation shipments were 70 per cent heavier than for the corresponding period of 1936.

Declines in scrap caused the iron and steel composite to lose 8 cents, moving from $40.55 to $40.47. The finished steel composite is unchanged at $61.70.

COMPOSITE MARKET AVERAGES

	Apr. 17	Apr. 10	Apr. 3	One Month Ago Mar., 1937	Three Months Ago Jan., 1937	One Year Ago Apr., 1936	Five Years Ago Apr., 1932
Iron and Steel	$40.47	$40.55	$40.19	$39.92	$36.55	$33.10	$29.44
Finished Steel	61.70	61.70	60.70	60.70	55.80	52.20	47.62
Steelworks Scrap ..	21.00	21.60	22.08	20.95	18.12	14.39	7.76

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	April 17, 1937	Mar. 1937	Jan. 1937	Apr. 1936
Steel bars, Pittsburgh	2.45c	2.40c	2.20c	1.85c
Steel bars, Chicago	2.50	2.45	2.25	1.90
Steel bars, Philadelphia	2.74	2.74	2.49	2.16
Iron bars, Terre Haute, Ind.	2.35	2.25	2.10	1.75
Shapes, Pittsburgh	2.25	2.20	2.05	1.80
Shapes, Philadelphia	2.45½	2.45½	2.25½	2.01½
Shapes, Chicago	2.30	2.25	2.10	1.85
Tank plates, Pittsburgh	2.25	2.20	2.05	1.80
Tank plates, Philadelphia	2.43½	2.43½	2.23½	1.99
Tank plates, Chicago	2.30	2.30	2.10	1.85
Sheets, No. 10, hot rolled, Pitts.	2.40	2.35	2.15	1.85
Sheets, No. 24, hot ann., Pitts.	3.15	3.10	2.80	2.40
Sheets, No. 24, galv., Pitts.	3.80	3.70	3.40	3.10
Sheets, No. 10, hot rolled, Gary	2.50	2.45	2.25	1.95
Sheets, No. 24, hot anneal., Gary	3.25	3.20	2.90	2.50
Sheets, No. 24, galvan., Gary	3.90	3.85	3.50	3.20
Plain wire, Pittsburgh	2.90	2.85	2.60	2.40
Tin plate, per base box, Pitts.	$5.35	4.85	4.85	5.25
Wire nails, Pittsburgh	2.75	2.70	2.25	2.10

Semifinished Material

Sheet bars, open-hearth, Youngs.	$37.00	$36.40	$34.00	$28.00
Sheet bars, open-hearth, Pitts.	37.00	36.40	34.00	28.00
Billets, open-hearth, Pittsburgh	37.00	36.40	34.00	28.00
Wire rods, No. 5 to ⅜-inch, Pitts.	47.00	46.20	43.00	40.00

Pig Iron

	April 17, 1937	Mar. 1937	Jan. 1937	Apr. 1936
Bessemer, del. Pittsburgh	$25.26	$24.85	$22.31	$20.81
Basic, Valley	23.50	23.10	20:50	19.00
Basic, eastern del. East Pa.	25.26	24.76	22.26	20.81
No. 2 fdy., del. Pittsburgh	25.21	24.80	22.21	20.31
No. 2 fdy., Chicago	24.00	23.20	21.00	19.50
Southern No. 2, Birmingham	20.38	19.88	17.38	15.50
Southern No. 2, del. Cincinnati	23.69	23.19	20.69	20.2007
No. 2X eastern, del. Phila.	26.135	25.63½	23.13½	21.68
Malleable, Valley	24.00	23.60	21.00	19.50
Malleable, Chicago	24.00	23.20	21.00	19.50
Lake Sup., charcoal, del. Chicago	30.04	28.95	26.54	25.2528
Gray forge, del. Pittsburgh	24.17	23.75	21.17	19.67
Ferromanganese, del. Pittsburgh	99.79	90.80	84.79	80.13

Scrap

Heavy melting steel, Pittsburgh	$22.75	$22.40	$18.95	$15.75
Heavy melt. steel, No. 2, East Pa.	18.75	18.75	16.40	12.56
Heavy melting steel, Chicago	20.25	20.90	18.25	14.35
Rail for rolling, Chicago	23.25	22.25	19.40	15.75
Railroad steel specialties, Chicago	23.75	22.35	19.65	15.85

Coke

Connellsville, furnace, ovens	$4.65	$4.05	$4.00	$3.50
Connellsville, foundry, ovens	5.30	4.25	4.25	4.25
Chicago, by-product foundry, del.	11.00	10.25	10.25	9.75

Steel, Iron, Raw Material, Fuel and Metals Prices

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Prices Subject to Quantity Extras and Deductions (Except Galvanized)

Hot Rolled No. 10, 24-48 in.

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, del.	2.60c
New York, del.	2.73c
Philadelphia, del.	2.69c
Birmingham	2.55c
St. Louis, del.	2.63c
Granite City, Ill.	2.60c
Pacific ports, f.o.b. dock	2.95c

Hot Rolled Annealed No. 24

Pittsburgh	3.15c
Gary	3.25c
Chicago, delivered	3.28c
Detroit, delivered	3.35c
New York, del.	3.48c
Philadelphia, del.	3.44c
Birmingham	3.30c
St. Louis, del.	3.38c
Granite City, Ill.	3.35c
Pacific ports, f.o.b. dock	3.80c

Galvanized No. 24

Pittsburgh	3.80c
Gary	3.90c
Chicago, delivered	3.93c
Philadelphia, del.	4.09c
New York, delivered	4.13c
Birmingham	3.95c
St. Louis, del.	4.03c
Granite City, Ill.	4.00c
Pacific ports, f.o.b. dock	4.40c

Tin Mill Black No. 28

Pittsburgh	3.30c
Gary	3.40c
St. Louis, delivered	3.53c
Granite City, Ill.	3.50c

Cold Rolled No. 10

Pittsburgh	3.10c
Gary	3.20c
Detroit, delivered	3.30c
Philadelphia, del.	3.39c
New York, del.	3.43c
St. Louis, del.	3.33c
Granite City, Ill.	3.30c
Pacific ports, f.o.b. dock	3.70c

Cold Rolled No. 20

Pittsburgh	3.55c
Gary	3.65c
Detroit, delivered	3.75c
Philadelphia, Pa.	3.84c
New York, del.	3.88c
St. Louis	3.78c
Granite City, Ill.	3.75c

Enameling Sheets

Pittsburgh, No. 10	2.90c
Pittsburgh, No. 20	3.50c
Gary, No. 10	3.00c
Gary, No. 20	3.60c
St. Louis, No. 10	3.13c
St. Louis, No. 20	3.73c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke, (base box), Pittsburgh	$5.35
Waste-waste, 2.75c; strip,	2.50c
Long ternes, No. 24 unassorted, Pitts.	4.10c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.25c
New York, del.	2.53c
Philadelphia, del.	2.43½c
Boston, delivered	2.65c
Buffalo, delivered	2.50c
Chicago or Gary	2.30c
Cleveland, del.	2.44½c
Birmingham	2.40c
Coatesville, base	2.35c
Sparrows Pt., base	2.35c
Pacific ports, f.o.b. cars, dock	2.80c
St. Louis, delivered	2.52c

Structural Shapes

Pittsburgh	2.25c
Philadelphia, del.	2.45½c
New York, del.	2.50½c
Boston, delivered	2.63½c
Bethlehem	2.35c
Chicago	2.30c
Cleveland, del.	2.45c
Buffalo	2.35c
Gulf Ports	2.65c
Birmingham	2.40c
Pacific ports, f.o.b. cars, dock	2.80c
St. Louis, del.	2.52c

Bars

Soft Steel (Base, 3 to 25 tons)

Pittsburgh	2.45c
Chicago or Gary	2.50c
Duluth	2.60c
Birmingham	2.60c
Cleveland	2.50c
Buffalo	2.55c
Detroit, delivered	2.60c
Pacific ports, f.o.b. cars, dock	3.00c
Philadelphia, del.	2.74c
Boston, delivered	2.85c
New York, del.	2.78c
Pitts., forg. qual.	2.80c

Rail Steel

To Manufacturing Trade

Pittsburgh	2.30c
Chicago or Gary	2.35c
Moline, Ill.	2.35c
Cleveland	2.35c
Buffalo	2.40c

Iron

Terre Haute, Ind.	2.35c
Chicago	2.40c
Philadelphia	2.64c
Pittsburgh, refined	3.50-8.00c

Reinforcing

New billet, straight lengths, quoted by distributors

Pittsburgh	2.55c
Chicago, Gary, Buffalo Cleve., Birm., Young.	2.60c
Gulf ports	2.65c
Pacific coast ports f.o.b. car docks	2.95c
Philadelphia, del.	2.84c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	2.40c
Chicago, Buffalo, Cleveland, Birm., Young.	2.45c
Gulf ports	2.80c

Wire Products

Prices apply to straight or mixed carloads; less carloads $5 higher; less carloads fencing $5 over base column.

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.75
Cement coated nails	$2.75

(Per pound)

Polished staples	3.45c
Galv. fence staples	3.70c
Barbed wire, galv.	3.40c
Annealed fence wire	3.20c
Galv. fence wire	3.60c
Woven wire fencing (base column, c. l.)	$74.00
Single loop bale ties, (base column, c. l.)	63.00

To Manufacturing Trade

Plain wire, 6-9 ga.	2.90c

Anderson, Ind. (merchant products only) and Chicago up $1; Duluth and Worcester up $2; Birmingham up $3.

Spring wire, Pitts. or Cleveland	3.50c

Do., Chicago up $1, Worc. $2.

Cold-Finished Carbon Bars and Shafting

Pittsburgh	2.90c
Chicago	2.95c
Gary, Ind.	2.95c
Detroit	2.95c
Cleveland	2.95c
Buffalo	3.00c

Subject to quantity deductions and extras. List dated Aug. 26, 1935; revised Oct. 1, 1936.

Alloy Steel Bars (Hot)

(*Base, 3 to 25 tons*)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	3.00c

Alloy	Diff.	Alloy	Diff.
S.A.E.		S.A.E.	
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo. 0.55
4600 0.20 to 0.30 Mo. 150-2.00 Ni. 1.10
5100 0.80-1.10 Cr. 0.45
5100 Cr. spring 0.15
6100 bars 1.20
6100 spring 0.85
Cr. Ni., Van. 1.50
Carbon Van. 0.85
9200 spring flats 0.15
9200 spring rounds, squares 0.40

Piling

Pittsburgh	2.60c
Chicago, Buffalo	2.70

Strip and Hoops

(Base, hot rolled, 25-1 ton)
(Base, cold-rolled, 25-3 tons)

Hot strip to 23/4-in.	
Pittsburgh	2.40c
Chicago or Gary	2.50c
Birmingham base	2.55c
Detroit, del.	2.60c
Philadelphia, del.	2.69c
New York, del.	2.73c
Cooperage hoop,	
Pittsburgh	2.50c
Chicago	2.60c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland	3.20c
Detroit, del.	3.40c
Worcester, Mass.	3.40c

Carbon	Cleve. Pitts.	Worcester, Mass.
0.26—0.50	3.20c	3.40c
0.51—0.75	4.45c	4.65c
0.76—1.00	6.30c	6.50c
Over 1.00	8.50c	8.70c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$42.50
Relay rails, Pittsburgh, 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pittsburgh, Chicago	$43.00
Do., rerolling quality	42.00
Angle bars, billet, Gary, Pittsburgh, So. Chicago	2.80c
Do., axle steel	3.35c
Spikes, R. R. base	3.15c
Track bolts, base	4.35c
Tie plates, base	$46.00

Base, light rails 25 to 40 lbs.; 50 to 60 lbs., inclusive up $2: 16 and 20 lbs. up $1; 12 lbs. up $2; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists:

Carriage and Machine

½ x 6 and smaller	65-5 off
Do. larger	60-10 off
Tire bolts	50 off

Plow Bolts

All sizes	65-5 off

Stove Bolts

In packages with nuts attached 72½ off; in packages with nuts separate 72½-5 off: in bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	60 off
Elevator bolts	50-10-5 off

Nuts

S. A. E. semifinished hex.:	
½ to 7/8-inch	60-20 off
Do., ½ to 1-inch	60-15 off
Do., over 1-inch	60-12½ off

Hexagon Cap Screws

Milled	50-10 off
Upset, 1-in., smaller	60 off

Square Head Set Screws

Upset, 1-in., smaller	75 off
Headless set screws	75 off

Rivets, Wrought Washers

Structural, Pittsburgh, Cleveland	3.60c
Structural, Chicago	3.70c
7/8-inch and smaller Pitts., Chi., Cleve.	70 off
Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs.	$5.75 off

Cut Nails

Cut nails, C. L., Pitts. (10% disc. on all extras)	$3.60
Do., less carloads, 5 kegs or more, no discount on any extras	$3.90
Do., under 5 kegs, no disc. on any extras	$4.05

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ less. Wrought pipe, Pittsburgh.

Butt Weld

Steel

In.	Blk.	Galv.
¼ and ⅜	55	38½
½	59½	49
¾	62½	53
1—3	64½	55½

Iron

⅛	20	1½
¼	26	8
1—1¼	30	14
1½	34	16½
2	33½	16

Lap Weld

Steel

2	57	47½
2½—3	60	50½
3½—6	62	52½
7 and 8	61	50½
9 and 10	60½	50

Iron

2	26½	10
2½—3½	27½	12½
4	29½	16
4½—8	28½	15
9-12	24½	10

Line Pipe

Steel

⅛, butt weld	51
¼ and ⅜, butt weld	54
½, butt weld	58½
¾, butt weld	61½
1 to 3, butt weld	63½
2, lap weld	56
2½ to 3, lap weld	59
3½ to 6, lap weld	61
7 and 8, lap weld	60
10-inch, lap weld	59½
12-inch, lap weld	58½

Iron

Butt	Black	Galv.
⅛	19	½
¾	25	7
1 and 1¼	29	13
1½	33	15½
2	32½	15
Lap		
1¼	18	½
1½	23½	17
2	25½	9
2½ to 3½	26½	11½
4	28½	15
4½ to 8	27½	14
9 to 12	23½	9

Seamless Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet, f.o.b. Pittsburgh, base price per 100 feet, subject to usual extras for quantity, length, etc.

	Hot Rolled	Cold Drawn
1" OD x 13 Ga.	$ 8.41	$ 9.46
1¼" OD x 13 Ga.	9.96	11.21
1½" OD x 13 Ga.	11.00	12.38
1¾" OD x 13 Ga.	12.51	14.09
2" OD x 13 Ga.	14.02	15.78
2¼" OD x 13 Ga.	15.63	17.60
2¼" OD x 12 Ga.	17.21	19.37
2½" OD x 12 Ga.	18.85	21.22
2¾" OD x 12 Ga.	19.98	22.49
3" OD x 12 Ga.	20.97	23.60
4½" OD x 10 Ga.	40.15	45.19
3½" OD x 11 Ga.	26.47	29.79
4" OD x 10 Ga.	32.83	36.96
5" OD x 9 Ga.	50.38	56.71
6" OD x 7 Ga.	77.35	87.07

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$46.00-47.00
4-in., Birmingham	49.00-50.00
4-in., Chicago	57.00-58.00
6 to 24-in., Chicago	54.00-55.00
6-in. & over, east fdy.	50.00
Do., 4-in.	53.00
Class A pipe $3 over Class B	
Stnd. fitgs., Birm. base	$100.00

Semifinished Steel

Billets and Blooms

4 x 4-*inch base; gross ton*

Pitts., Chi., Cleve., Buffalo and Young.	$37.00
Philadelphia	42.30
Duluth	39.00

Forging Billets

6 x 6 *to* 9 x 9-*in., base*

Pitts., Chicago, Buffalo.	43.00
Forging, Duluth	45.00

Sheet Bars

Pitts., Cleve., Young., Sparrows Point	37.00

Slabs

Pitts., Chicago, Cleveland, Youngstown	37.00

Wire Rods

Pitts., Cleve., No. 5 to 5/16-inch incl.	47.00
Do., over 5/16 to 21/64-inch incl.	52.00

Chicago up $1; Worcester up $2.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	2.10c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$4.60- 4.75
Connellsville, fdry.	5.25- 5.50
Connell. prem. fdry.	6.00- 6.50
New River fdry.	6.50- 6.75
Wise county fdry.	5.75- 6.00
Wise county fur.	4.75- 5.00

By-Product Foundry

Newark, N. J., del.	10.85-11.30
Chi., ov., outside del.	10.25
Chicago, del.	11.00
Milwaukee, ovens	11.00
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.25
Indianapolis, del.	10.50
Cincinnati, del.	10.50
Cleveland, del.	11.00
Buffalo, del.	10.50
Detroit, del.	10.85
Philadelphia, del.	10.60

Coke By-Products

Spot, gal. Producers' Plants

Pure and 90% benzol	16.00c
Toluol	30.00c
Solvent naphtha	30.00c
Industrial xylol	30.00c

Per lb. f.o.b. Frankford

Phenol (200 lb. drums)	15.00c
Do., (450 lbs.)	14.00c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls., to jobbers	7.25c

Per 100-lbs. Atlantic seaboard

Sulphate of ammonia	$1.35†

†Western prices, ½-cent up.

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:	No. 2 Fdry.	Malle-able	Basic	Besse-mer
Bethlehem, Pa.	$25.00	$25.50	$23.50	$26.00
Birdsboro, Pa.	25.00	25.50	24.50	26.00
Birmingham, Ala.‡	20.38	.....	19.38	24.50
Buffalo	24.00	24.50	23.00	25.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	.....	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.75	26.25	25.25	26.75
Hamilton, O.	24.00	24.00	23.50	.....
Jackson, O.	24.00	24.00	.....	.....
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	21.00	.....	.....	.....
Sharpsville, Pa.	24.00	24.00	23.50	24.50
Sparrows Point, Md.	25.00	.....	24.50	.....
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00	24.00	23.50	24.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:

Akron, O., from Cleveland	25.26	25.26	24.76	25.76
Baltimore from Birmingham	25.58	.....	24.46	.....
Boston from Birmingham	26.37	.....	25.87	.....
Boston from Everett, Mass.	26.25	26.75	25.75	27.25
Boston from Buffalo	26.25	26.75	25.75	27.25
Brooklyn, N. Y., from Bethlehem	27.27	27.77	.....	.....
Brooklyn, N. Y., from Bmghm.	27.05	.....	.....	.....
Canton, O., from Cleveland	25.26	25.26	25.76	25.76
Chicago from Birmingham	24.22	.....	24.10	.....
Cincinnati from Hamilton, O.	24.07	25.01	24.51	.....
Cincinnati from Birmingham	23.69	.....	22.69	.....
Cleveland from Birmingham	24.12	.....	23.62	.....
Mansfield, O., from Toledo, O.	25.76	25.76	25.26	25.26
Milwaukee from Chicago	25.00	25.00	24.50	25.00
Muskegon, Mich., from Chicago, Toledo or Detroit	26.90	26.90	26.40	27.40
Newark, N. J., from Birmingham	26.01	.....	.....	.....
Newark, N. J., from Bethlehem	26.39	26.89	.....	.....
Philadelphia from Birmingham	25.38	.....	25.26	.....
Philadelphia from Swedeland, Pa.	25.76	26.26	25.26	.....
Pittsburgh district from Neville Island	∫ Neville, base plus 63c, 76c, ⌇ and $1.13 switch'g charges			
Saginaw, Mich., from Detroit	26.25	26.25	25.75	25.75
St. Louis, northern	24.50	24.50	24.00	.....
St. Louis from Birmingham	†24.12	.....	23.82	.....
St. Paul from Duluth	25.94	25.94	.....	26.44

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $28.50, Phila. base, standard and copper bearing, $29.63.

Gray Forge		Charcoal	
Valley furnace	$23.50	Lake Superior fur.	$27.00
Pitts. dist. fur.	23.50	do., del. Chicago	30.04
		Lyles, Tenn.	26.50

Silvery†

Jackson county, O., base: 6-6.50 per cent $28.50; 6.51-7—$29.00; 7-7.50—$29.50; 7.51-8—$30.00; 8-8.50—$30.50; 8.51-9—$31.00; 9-9.50—$31.50; Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$64.60

First Quality

Pa., Ill., Md., Mo., Ky.	51.30
Alabama, Georgia	51.30

Second Quality

Pa., Ill., Ky., Md., Mo.	46.55
Georgia, Alabama	41.80

Ohio

First quality	43.70
Intermediate	39.90
Second quality	35.15

Malleable Bung Brick

All bases	$59.85

Silica Brick

Pennsylvania	$51.30
Joliet, E. Chicago	59.85
Birmingham, Ala.	51.30

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$30.00
Wire cut	$28.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	43.00
Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk)	25.00

Base Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$49.00
Chem. bonded chrome	49.00
Magnesite brick	69.00
Chem. bonded magnesite	59.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$23.50
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	$19.00
Do., for barge	$20.00

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead: New York N. Y.	Lead: East St. L.	Zinc St. L.	*Aluminum 99%	Antimony Chinese Spot, N. Y.	Nickel Cathodes
Apr. 10	15.50	16.12½	15.25	61.25	60.62½	6.00	5.85	7.00	20.00	17.00	35.00
Apr. 12	15.50	16.12½	15.25	60.00	59.12½	6.00	5.85	7.00	20.00	17.00	35.00
Apr. 13	15.50	16.12½	15.25	60.62½	59.75	6.00	5.85	7.00	20.00	17.00	35.00
Apr. 14	15.50	16.12½	15.25	60.87½	60.25	6.00	5.85	7.00	20.00	17.00	35.00
Apr. 15	15.50	16.12½	15.25	59.75	59.00	6.00	5.85	7.00	20.00	17.00	35.00
Apr. 16	15.50	15.12½	15.25	58.50	57.87½	6.00	5.85	7.00	20.00	17.00	35.00

*Carlot prices.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 15.50c Conn. copper

Sheets

*Yellow brass (high)	20.62½
*Copper, hot rolled	23.12½
Lead, cut to jobbers	9.50
Zinc, 100-lb. base	12.50-13.00

Tubes

*High yellow brass	23.37½
*Seamless copper	23.87½

Rods

*High yellow brass	17.00
*Copper, hot rolled	19.87½

Anodes

*Copper, untrimmed	20.37½

Wire

*Yellow brass (high)	20.87½

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass

*New York	10.00
Cleveland	10.25-10.37½
Chicago	10.00-10.25
St. Louis	10.50

Heavy Copper and Wire

*New York, No. 1	12.50
Cleveland, No. 1	12.00-12.25
Chicago, No. 1	12.00-12.25
*St. Louis, No. 1	12.25-12.50

Composition Brass Borings

*New York	9.50

Light Copper

*New York	10.50
Cleveland	10.00-10.25
Chicago	10.00-10.25
*St. Louis	10.50-10.75

Light Brass

*Chicago	6.50- 6.75
Cleveland	6.50- 6.75
St. Louis	6.75- 7.00

Lead

*New York	4.25- 4.50
Cleveland	4.75- 5.00
Chicago	5.00-5.12½
St. Louis	5.12½- 5.25

Zinc

*New York	3.25- 3.50
Cleveland	3.75- 4.00
St. Louis	4.00- 4.50

Aluminum

Borings, Cleveland	10.75-11.00
Mixed, cast, Cleve.	14.00-14.25
Clips, soft, Cleve.	15.50-15.75
Mixed, cast, St. L.	13.50-14.00

SECONDARY METALS

Brass, ingot 85-5-5-5, lcl.	15.50
Stand. No. 12 alum.	18.75-19.25

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82%, tidewater, duty paid	$95.00
Do., Baltimore, base	95.00
Do., del. Pittsburgh	99.79
Spiegeleisen, 19-20% dom. Palmerston, Pa., spot	30.00
Do., New Orleans	30.00
Ferrosilicon, 50% freight allowed, c.l.	69.50
Do., less carload	77.00
Do., 75 per cent	126-130.00
Spot, $5 a ton higher.	
Silicoman., 2½ carbon	89.00
2% carbon, 94.00; 1%	104.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.50
Ferrotungsten, stand., lb. con. del. cars	1.70
Ferrovanadium, 35 to 40% lb., cont.	2.70-2.90
Ferrotitanium, c. l., prod. plant, frt. all., net ton	142.50
Spot, carlots	145.00
Spot, ton lots	150.00
Ferrophosphorus, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, $3 unitage	58.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $3 unitage	75.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80
†Carloads. Quan. diff. apply	

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS

Baltimore	3.85c
Boston ††	4.05c
Buffalo	3.10c
Chattanooga	3.96c
Chicago (j)	3.85c
Cincinnati	3.55c
Cleveland	3.75c
Detroit	3.93½c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.96c-4.11c
New Orleans	4.20c
New York‡ (d)	4.12c
Pitts. (h)	3.80c
Philadelphia	4.00c
Portland	4.45c
San Francisco	4.20c
Seattle	4.45c
St. Louis	4.09c
St. Paul	4.10c-4.25c
Tulsa	3.35c

IRON BARS

Portland	3.50c
Chattanooga	3.96c
Baltimore*	3.10c
Cincinnati	3.55c
New York‡ (d)	3.65c
Philadelphia	4.00c
St. Louis	4.09c
Tulsa	3.35c

REINFORCING BARS

Buffalo	2.60c
Chattanooga	3.96c
Cleveland (c)	2.55c
Cincinnati	3.40c
Houston	3.25c
Los Angeles, c.l.	2.45c
New Orleans*	3.14c
Pitts., plain (h)	2.55c
Pitts., twisted squares (h)	3.95c
San Francisco	2.97½c
Seattle	4.02½c
St. Louis	3.99c
Tulsa	3.25c
Young	2.30c-2.60c

SHAPES

Baltimore	3.85c
Boston††	3.92c
Buffalo	3.35c
Chattanooga	4.01c
Chicago	3.75c
Cincinnati	3.65c
Cleveland	3.86c
Detroit	3.95c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.86c
New Orleans	4.10c
New York‡ (d)	3.97c
Philadelphia	3.90c
Pittsburgh (h)	3.70c
Portland (i)	4.45c
San Francisco	4.05c
Seattle (i)	4.45c
St. Louis	3.99c
St. Paul	4.00c
Tulsa	3.60c

PLATES

Baltimore	3.80c
Boston††	3.93c
Buffalo	3.47c
Chattanooga	4.01c
Chicago	3.75c
Cincinnati	3.65c
Cleveland, ¼-in. and over	3.86c
Detroit	3.95c
Detroit, ⅜-in.	4.15c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.86c
New Orleans	4.10c
New York‡ (d)	4.00c
Philadelphia	3.90c
Phila. floor	4.95c
Pittsburgh (h)	3.70c
Portland	4.25c
San Francisco	4.05c
Seattle	4.25c
St. Louis	3.99c
St. Paul	4.00c
Tulsa	3.60c

NO. 10 BLUE

Baltimore	3.80c
Boston (g)	4.00c
Buffalo	3.72c
Chattanooga	3.91c
Chicago	3.85c
Cincinnati	3.50c
Cleveland	3.91c
Det. 8-10 ga.	3.93½c
Houston	3.45c
Los Angeles	4.50c
Milwaukee	3.96c
New Orleans	4.10c
New York‡ (d)	4.07c
Portland	4.50c
Philadelphia	4.00c
Pittsburgh (h)	3.75c
San Francisco	4.30c
Seattle	4.50c
St. Louis	4.39c
St. Paul	4.10c
Tulsa	3.80c

NO. 24 BLACK

Baltimore*†	4.50c
Boston (g)	4.75c
Buffalo	3.35c
Chattanooga*	4.06c
Chicago	4.45c-5.10c
Cincinnati	4.05c
Cleveland	4.66c
Detroit	4.68½c
Los Angeles	5.05c
Milwaukee	4.56c-5.21c
New York‡ (d)	4.82c
Philadelphia	4.65c
Pitts.** (h)	4.75c
Portland	5.35c
Seattle	5.35c
San Francisco	5.15c
St. Louis	4.84c
St. Paul	4.75c
Tulsa	4.85c

NO. 24 GALV. SHEETS

Baltimore*†	4.70c
Buffalo	4.10c
Boston (g)	5.30c
Chattanooga*	4.76c
Chicago (h)	5.10c-5.75c
Cincinnati	4.65c
Cleveland	5.31c
Detroit	5.40c
Houston	4.50c
Los Angeles	5.55c
Milwaukee	5.21c-5.86c
New Orleans*	4.49c
New York‡ (d)	5.47c
Philadelphia	5.30c
Pitts.** (h)	5.40c
Portland	5.90c
San Francisco	5.85c
Seattle	5.90c
St. Louis	5.49c
St. Paul	5.40c
Tulsa	5.20c

BANDS

Baltimore	3.85c
Boston††	4.25c
Buffalo	3.52c
Chattanooga	4.16c
Cincinnati	3.75c
Cleveland	4.16c
Chicago	4.10c
Detroit, ⅜-in. and lighter	4.185c
Houston	3.35c
Los Angeles	4.50c
Milwaukee	4.21c
New Orleans	4.75c
New York‡ (d)	4.32c
Philadelphia	4.10c
Pittsburgh (h)	4.00c
Portland	4.95c
San Francisco	4.50c
Seattle	4.95c
St. Louis	4.34c
St. Paul	4.35c
Tulsa	3.55c

HOOPS

Baltimore	4.10c
Boston††	5.25c
Buffalo	3.52c
Chicago	4.10c
Cincinnati	3.75c
Detroit, No. 14 and lighter	4.185c
Los Angeles	6.55c
Milwaukee	4.21c
New York‡ (d)	4.32c
Philadelphia	4.35c
Pittsburgh (h)	4.50c
Portland	6.30c
San Francisco	6.50c
Seattle	6.30c
St. Louis	4.34c
St. Paul	4.35c

COLD FIN. STEEL

Baltimore (c)	4.50c
Boston*	4.65c
Buffalo (h)	3.70c
Chattanooga*	4.86c
Chicago (h)	4.30c
Cincinnati	4.15c
Cleveland (h)	4.30c
Detroit	4.30c
Los Ang. (f) (d)	6.85c
Milwaukee	4.41c
New Orleans	5.10c
New York‡ (d)	4.57c
Philadelphia	4.53c
Pittsburgh	4.15c
Portland (f) (d)	5.85c
San Fran. (f) (d)	6.80c
Seattle (f) (d)	5.85c
St. Louis	4.54c
St. Paul	4.77c
Tulsa	4.80c

COLD ROLLED STRIP

Boston	3.845c
Buffalo	3.39c
Chicago	3.87c
Cincinnati	3.00c
Cleveland (b)	3.60c
Detroit	3.43c
New York‡ (d)	3.92c
St. Louis	4.54c

TOOL STEELS

(Applying on or east of Mississippi river; west of Mississippi 1c up.)

	Base
High speed	69c
High carbon, Cr	45c
Oil hardening	26c
Special tool	24c
Extra tool	20c
Regular tool	16c
Water hardening	12½c

Uniform extras apply.

BOLTS AND NUTS

(100 pounds or over)

	Discount
Chicago (a)	55 to 60
Cleveland	60-5-5
Detroit	70-10
Milwaukee	60 to 65
New Orleans	65
Pittsburgh	65-5

(a) Under 100 lbs., 50 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Quantity base; (e) New mill classif. (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less; (i) Under 3 in.; (j) Shapes other than rounds, flats, fillet angles, 0.15c higher.

On plates, shapes, bars, hot strip and blue annealed quantity extras and discounts as follows: Under 100 lbs., add $1.50; 100 to 399 lbs., add 50c; 400 to 3999 lbs., base; 4000 to 9999 lbs., deduct 10c; over 10,000 lbs., deduct 15c. At Cleveland, under 400 lbs., add 50c, with $1 minimum invoice.

‡Domestic steel; *Plus quantity extras; **One to 9 bundles; *†50 or more bundles; †New extras apply; ††Base 10,000 lbs., extras on less.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, April 15

Export Prices f. o. b. Ship at Port of Dispatch—(By Cable or Radio)

	British gross tons U. K. ports		Continental Channel or North Sea ports, metric tons	
			Quoted in dollars at current value	**Quoted in gold pounds sterling
PIG IRON	£ s d			£ s d
Foundry, 2.50-3.00 Silicon	$24.50	5 0 0	$28.06	3 9 0
Basic bessemer	19.23	3 18 6*	14.23	1 15 0
Hematite, Phos. .03-.05	21.44	4 7 6	.....	.....
SEMIFINISHED STEEL				
Billets	$30.62	6 5 0	$27.24	3 7 0
Wire rods, No. 5 gage	47.16	9 12 6	48.80	6 0 0
FINISHED STEEL				
Standard rails	$42.88	8 15 0	$48.80	6 0 0
Merchant bars	2.19c	10 0 0	1.85c	5 0 0
Structural shapes	2.11c	9 12 6	1.80c	4 17 6
Plates, †¼ in. or 5 mm.	2.23c	10 3 9	2.27c	6 2 6
Sheets, black, 24 gage or 0.5 mm.	2.85c	13 0 0	2.87c	7 15 0††
Sheets, gal., 24 gage, corr.	3.67c	16 15 0	3.61c	9 15 0
Bands and strips	2.19c	10 0 0	2.39c	6 10 0
Plain wire, base	2.41c	11 0 0	2.77c	7 10 0
Galvanized wire, base	3.18c	14 10 0	2.96c	8 0 0
Wire nails, base	2.63c	12 0 0	3.14c	8 10 0
Tin plate, box 108 lbs.	$ 6.00	1 4 6	.....	.....

British ferromanganese $95 delivered Atlantic seaboard, duty-paid.

Domestic Prices at Works or Furnace—Last Reported

		£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$19.84	4 1 0(a)	$18.96	425	$26.96	800	$25.34	63
Basic bessemer pig iron	20.21	4 2 6(a)	12.27	275	14.66	435	27.96 (b)	69.50
Furnace coke	6.61	1 7 0	6.11	137	5.73	170	7.64	19
Billets	30.62	6 5 0	26.31	590	25.61	760	38.82	96.50
Standard rails	1.81c	8 5 0	1.56c	780	1.80c	1,200	2.40c	132
Merchant bars	2.08c	9 10 0	1.60c	800	1.46c	975	2.00c	110
Structural shapes	2.00c	9 3 0	1.56c	780	1.46c	975	1.95c	107
Plates, †¼-in. or 5 mm.	2.15c	9 16 9	2.02c	1,010	1.97c	1,245	2.31c	127
Sheets, black	3.07c	14 0 0§	2.70c	1,350‡	2.19c	1,460‡	2.62c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	3.72c	17 0 0	4.20c	2,100	2.85c	1,900	6.73c	370
Plain wire	2.57c	11 15 0	2.72c	1,360	2.48c	1,650	3.15c	173
Bands and strips	2.24c	10 5 0	1.83c	915	1.88c	1,250	2.31c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. a del. Middlesbrough. b hematite. ††Close annealed.

**Gold pound sterling carries a premium of 67 per cent over paper sterling.

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham†	14.50-15.50
Bos. dock, No. 1, exp.	17.50-18.00
N. Eng. del. No. 1	17.50
Buffalo, No. 1	20.00-21.00
Buffalo, No. 2	19.00-19.50
Chicago, No. 1	20.00-20.50
Cleveland, No. 1	21.00-21.50
Cleveland, No. 2	19.50-20.00
Detroit, No. 1	17.25-17.75
Eastern Pa., No. 1	20.00
Eastern Pa., No. 2	18.50-19.00
Federal, Ill.	16.25-16.75
Granite City, R. R.	18.25-18.75
Granite City, No. 2	16.25-16.75
New York, No. 1	17.00-17.50
N. Y. dock, No. 1 exp.	17.50-18.00
Pitts., No. 1 (R. R.)	23.50-24.00
Pitts., No. 1 (dir.)	22.50-23.00
Pittsburgh, No. 2	19.00-19.50
St. Louis, R. R.	18.50-19.00
St. Louis, No. 2	16.50-17.00
Toronto, dirs. No. 1	11.00-12.00
Toronto, No. 2	10.00-11.00
Valleys, No. 1	23.00-23.50

COMPRESSED SHEETS

Buffalo, dealers	19.00-19.50
Chicago, factory	19.00-19.50
Chicago, dealer	18.00-18.50
Cleveland	20.50-21.00
Detroit	19.00-19.50
E. Pa., new mat.	20.00
E. Pa., old mat.	16.50-17.00
Pittsburgh	22.50-23.00
St. Louis	16.00-16.50
Valleys	22.00-22.50

BUNDLED SHEETS

Buffalo	16.00-16.50
Cincinnati, del.	14.50-15.00
Cleveland	16.50-17.00
Pittsburgh	21.00-21.50
St. Louis	13.50-14.00
Toronto, dealers	8.00

SHEET CLIPPINGS, LOOSE

Chicago	13.50-14.00
Cincinnati	13.50-14.00
Detroit	14.00-14.50
St. Louis	13.50-14.00

STEEL RAILS, SHORT

Birmingham	18.00-18.50
Buffalo	24.50-25.50
Chicago (3 ft.)	23.00-23.50
Chicago (2 ft.)	24.50-25.00
Cincinnati, del.	22.50-23.00
Detroit	24.00-24.50
Pitts., 3 ft. and less	26.50-27.00
St. Louis, 2 ft. & less	20.00-20.50

STEEL RAILS, SCRAP

Boston, district	†17.25-17.50
Buffalo	21.00-22.00
Chicago	20.50-21.00
Cleveland	22.00-22.50
Pittsburgh	23.50-24.00
St. Louis	20.00-20.50

STOVE PLATE

Birmingham	11.00-11.50
Boston district	†11.50-11.75
Buffalo	15.00-16.00
Chicago	12.00-12.50
Cincinnati, dealers	11.50-12.00
Detroit, net	12.00-12.25
Eastern Pa.	16.00-16.50
New York, fdry.	†12.50
St. Louis	12.00-12.50
Toronto, deal'rs, net	9.50-10.00

SPRINGS

Buffalo	22.50-23.50
Chicago, leaf	23.50-24.00
Chicago, coil	25.00-25.50
Eastern Pa.	25.50-26.00
Pittsburgh	27.00-27.50
St. Louis	22.00-22.50

ANGLE BARS—STEEL

Buffalo	14.50-15.00
Chicago	23.50-24.00
St. Louis	19.50-20.00

RAILROAD SPECIALTIES

Chicago	23.50-24.00

LOW PHOSPHORUS

Buffalo, billet and bloom crops	24.00-24.50
Cleveland, billet, bloom crops	25.00-26.00
Eastern Pa., crops	27.00-27.50
Pittsburgh, billet, bloom crops	27.00-27.50
Pittsburgh, sheet bar crops	26.50-27.00

FROGS, SWITCHES

Chicago	20.50-21.00
St. Louis, cut	20.00-20.50

SHOVELING STEEL

Chicago	20.00-20.50
Federal, Ill.	16.25-16.50
Granite City, Ill.	16.25-16.50
Toronto, dealers	9.00- 9.50

RAILROAD WROUGHT

Birmingham	13.00-13.50
Boston district	†10.00-10.25
Buffalo, No. 1	19.00-19.50
Buffalo, No. 2	20.00-21.00
Chicago, No. 1, net	18.50-19.00
Chicago, No. 2	20.00-20.50
Cincinnati, No. 2	17.50-18.00
Eastern Pa.	21.00
St. Louis, No. 1	15.50-16.00
St. Louis, No. 2	18.00-18.50
Toronto, No. 1 dlr.	15.00

SPECIFICATION PIPE

Eastern Pa.	17.00-17.50
New York	13.00-13.50

BUSHELING

Buffalo, No. 1	19.00-19.50
Chicago, No. 1	19.00-19.50
Cincin., No. 1, deal.	15.50-16.00
Cincinnati, No. 2	10.00-10.50
Cleveland, No. 2	14.00-14.50
Detroit, No. 1 new	16.50-17.00
Valleys, new, No. 1	21.00-21.50
Toronto, dealers	9.00

MACHINE TURNINGS

Birmingham	8.00- 8.50
Buffalo	13.50-14.00
Chicago	11.50-12.00
Cincinnati, dealers	12.00-12.50
Cleveland	13.50-14.00
Detroit	13.00-13.50
Eastern Pa.	14.50-15.00
New York	†10.00-10.25
Pittsburgh	15.00-15.50
St. Louis	10.50-11.00
Toronto, dealers	8.00- 8.50
Valleys	15.50-16.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	†8.75- 9.00
Buffalo	14.00-14.50
Cincinnati, dealers	10.75-11.25
Cleveland	14.00-14.50
Detroit	13.00-13.50
Eastern Pa.	14.00
New York	†9.50- 9.75
Pittsburgh	14.50-15.00
Toronto, dealers	8.00- 8.50

CAST IRON BORINGS

Birmingham	8.00- 8.50
Boston dist. chem.	†10.00-10.25
Boston dist. for mills	†9.25
Buffalo	14.00-14.50
Chicago	13.00-13.50
Cincinnati, dealers	10.75-11.25
Cleveland	14.00-14.50
Detroit	13.00-13.50
E. Pa., chemical	15.50
New York	†9.50- 9.75
St. Louis	10.50-11.00
Toronto, dealers	9.00

PIPE AND FLUES

Cincinnati, dealers	11.50-12.00
Chicago, net	14.50-15.00

RAILROAD GRATE BARS

Buffalo	15.50-16.00
Chicago, net	13.50-14.00
Cincinnati	11.50-12.00
Eastern Pa.	17.00-17.50
New York	†11.00-11.50
St. Louis	12.50-13.00

FORGE FLASHINGS

Boston district	†13.00-13.25
Buffalo	19.00-19.50
Cleveland	19.50-20.00
Detroit	15.75-16.25
Pittsburgh	19.50-20.00

FORGE SCRAP

Boston district	†6.50- 7.00
Chicago, heavy	25.00-25.50
Eastern Pa.	16.00

ARCH BARS, TRANSOMS

St. Louis	19.00-19.50

AXLE TURNINGS

Boston district	†11.00-11.50
Buffalo	16.00-17.00
Chicago, elec. fur.	21.00-21.50
Eastern Pa.	19.50-20.00
St. Louis	12.50-13.00
Toronto	9.50

STEEL CAR AXLES

Birmingham	22.00-23.00
Buffalo	22.50-23.50
Boston district	†20.00-21.00
Chicago, net	25.00-25.50
Eastern Pa.	28.00-28.50
St. Louis	24.00-24.50

SHAFTING

Boston district	†20.00-20.50
New York	†20.00-20.50
Eastern Pa.	25.00
St. Louis	14.00-14.50

CAR WHEELS

Birmingham	18.00-20.00
Boston dist., iron	†15.00-15.25
Buffalo, iron	19.50-20.50
Buffalo, steel	23.00-24.00
Chicago, iron	21.50-22.00
Chicago, rolled steel	23.50-24.00
Cincinnati, iron	20.00-20.50
Eastern Pa., iron	22.00-22.50
Eastern Pa., steel	25.50-26.00
Pittsburgh, iron	20.50-21.00
Pittsburgh, steel	27.00-27.50
St. Louis, iron	18.00-18.50
St. Louis, steel	21.00-21.50

NO. 1 CAST SCRAP

Birmingham	13.00-14.00
Bos. dist. No. 1 mach.	†14.50-14.75
N. Eng. del. No. 2	17.50
N. Eng. del. textile	18.50
Buffalo, cupola	19.00-19.50
Buffalo, mach.	20.00-21.00
Chicago, agri. net	14.00-14.50
Chicago, auto	16.00-16.50
Chicago, mach. net	17.50-18.00
Chicago, railr'd net	16.00-16.50
Cinci., mach. cup.	17.00-17.50
Cleveland, mach.	20.00-20.50
Eastern Pa., cupola	22.50-23.00
E. Pa., mixed yard	18.50-19.00
Pittsburgh, cupola	19.50-20.00
San Francisco, del.	13.50-14.00
Seattle	12.00-13.00
St. Louis, No. 1	14.75-15.25
St. L., No. 1, mach.	16.00-16.50
Toronto, No. 1, mach., net	16.00-17.00

HEAVY CAST

Boston dist. break.	†14.25-14.50
New England, del.	17.00-17.25
Buffalo, break.	16.00-16.50
Cleveland, break.	15.50-16.00
Detroit, No. 1 mach. net	13.50-14.00
Detroit, break.	14.50-15.00
Detroit, auto net	16.00-16.50
Eastern Pa.	19.00
New York, break.	†15.00-15.50
Pittsburgh	17.50-18.00

MALLEABLE

Birmingham, R. R.	15.00-15.50
New England, del.	20.00
Buffalo	23.00-24.00
Chicago, R. R.	22.00-22.50
Cinci., agri. del.	16.50-17.00
Cleveland, rail.	21.50-22.00
Detroit, auto, net	17.50-18.00
Eastern Pa., R. R.	21.00-21.50
Pittsburgh, rail	21.00-21.50
St. Louis, R. R.	20.00-20.50

RAILS FOR ROLLING

5 feet and over

Birmingham	18.00-20.00
Boston	†18.00-18.50
Buffalo	23.00-24.00
Chicago	23.00-23.50
Eastern Pa., R. R.	21.00-21.50
New York	†18.00-18.50
St. Louis	20.50-21.00

LOCOMOTIVE TIRES

Chicago (cut)	24.00-24.50
St. Louis, No. 1	20.00-20.50

LOW PHOS. PUNCHINGS

Buffalo	23.00-23.50
Chicago	24.00-24.50
Eastern Pa.	26.00-27.00
Pittsburgh (heavy)	26.00-26.50
Pittsburgh (light)	25.00-25.50

Iron Ore

Lake Superior Ore

Gross ton, 51½%

Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbess.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbess.	5.10

Eastern Local Ore

Cents, unit. del. E. Pa.

Foundry and basic 56.63% con.	9.00-10.00
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, f.a.s. Atlantic ports

Foreign manganiferous ore, 45.55% iron, 6-10% man.	*16.00
No. Afr. low phos.	*16.00
Swedish low phos.	nominal
Spanish No. Africa basic, 50 to 60%	*15.50
Tungsten, spot sh. ton, unit, duty pd.	$22.50-23.00
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$24.50-25.00

*Nominal asking price.

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52%	44.00
So. African, 50-52%	Nominal
Indian, 50-52%	Nominal

Bars

Bar Prices, Page 88

Pittsburgh—New business so far this month has been under the comparable period in March, but this is not unusual. Actually current diversified demand has exceeded expectations. Producers have been unable to better delivery and it is hard to obtain even quick rolling under four to six weeks. Important factors are sizes and amount of tonnage desired. Some producers would welcome easing pressure for shipments, which are comparable to March.

Cleveland—Bar mills are sold well into the third week of May and all available semifinished material for second quarter has been booked. This condition has recently been alleviated by a decline in specifications. Stocks of most consumers are less than expected, after the record shipments of February and March. Requirements for commercial and cold-drawn alloy steel bars from machine tool builders and automobile partsmakers continues well above normal.

Chicago—Heavy bar demand has absorbed most of capacity through July and consumers now are less active in making forward commitments. Shipments continue to tax producing facilities and no let-up is apparent in consumption. Both automotive and farm implement and tractor building operations are being maintained at peak rates. Producers defer quoting prices on tonnages for shipment after June despite requests from customers for definite figures.

Boston—Commercial steel bar buying has tapered slightly with some improvement in delivery. Alloy bars, heat-treated material and stocks entering specialty industrial lines are still subject to delayed shipments with delivery rarely under six weeks. Demand for the latter finishes is high. Soft steel bars are firm at 2.85c, Boston.

New York—Commercial steel bar buying is lighter, although deliveries against contracts have not been lessened. Bolt and nut manufacturers and jobbers are specifying freely.

Philadelphia—Commercial steel bar deliveries continue around six weeks, with some mills averaging a little more and at least two producers able to do a little less. New demand now appears on verge of making inroads into backlogs, buying over past fortnight in particular showing a downward trend. Prices are strong at 2.45c, Pittsburgh, or 2.74c, Philadelphia.

Youngstown, O.—Steel bar orders continue heavy and no let-up appears in sight. For second quarter delivery it has become practically

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impossible to find a place on mill books; and such orders are confined to second quarter.

Plates

Plate Prices, Page 88

Cleveland—Fabricators continue to have difficulty in getting material, with deliveries now at twelve weeks and no appreciable let-up in specifications apparent. Most tonnage is going into structural jobs, while miscellaneous tonnage is confined to small lots from specialty manufacturers. Shipments continue at capacity with operations well sustained by new business.

Chicago—It seems assured that freight car building will be continued through the remainder of the year near its present active rate and that plate demand for such purposes will continue heavy. Tank fabricators are busy and have prospects for additional business from oil companies. Building of several pipe lines is under consideration but most of these will take small diameter material.

Boston—Tank requirements are slightly heavier, although 500 tons for oil storage needs, Neponset district, Boston, is held up by a successful protest against location of the units in that area. Industrial, shipyard and miscellaneous buying is generally well maintained with spotty recessions in some directions. Consumers have released good tonnages in numerous instances against contracts, seeking early delivery as possible. The Texas Co. will build five oil storage tanks at Brockton, Mass., taking a moderate tonnage.

New York—New plate tonnage is lighter but producers have been unable to make inroads into backlogs. Considerable tonnage for identified projects is still to be placed before April 30 when protections expire. A steamer for the United States Lines is expected to be closed before the end of the month.

Philadelphia—Eastern platemakers continue to increase their backlogs, with little tonnage available for delivery in this quarter. Placing of tonnage against identified work, on which protections are due to expire April 30, is contributing substantially to the current volume. However, there is less new buying than a fortnight ago. Some trade interests believe that after April 30, the lull will be more pronounced. Meanwhile prices are firm at 2.35c, Coatesville, or 2.435c, Philadelphia.

Washington—President Roosevelt has asked the navy department to redesign both large and small dry docks, containing considerable steel, on which bids have been received twice, both times much higher than the available appropriation.

San Francisco—Demand for plates remains quiet and awards were for lots of less than 100 tons. Salem, Oreg., has opened bids on a small footage of 20 and 24-inch welded steel pipe, ¼-inch material as an alternate on cast iron pipe. So far this year 21,494 tons have been placed, compared with 49,104 tons for the corresponding period in 1936.

Seattle—New business is developing in greater volume while small tonnages continue to give shops considerable work.

Plate Contracts Placed

700 tons, 30-inch water mains Spokane, to Steel Tank & Pipe Co., Portland; Charles A. Power, Spokane, general contractor.

410 tons, 1,500,000-gallon tank, Manitowoc, Wis., to Chicago Bridge & Iron Works, Chicago.

100 tons, insulated walls and miscellaneous for Boeing airplane assembly plant, Seattle, to Truscon Steel Co., Youngstown, O.; the Austin Co., Seattle, general contractor.

Unstated, tank and tower, Altheimer, Ark., procurement division treasury de-

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GARAGE IN CONNECTION

(AT CASS AND BAGLEY AVENUES)

D E T R O I T

partment, to Pittsburgh Des Moines Steel Co., Des Moines, Iowa.

Plate Contracts Pending

230 tons, oil storage tank for Seattle Gas Co.; bids in.

100 tons or more, 500,000-gallon elevated tank, Washington, bids April 26 to district commissioners.

100 tons or more, twin-screw diesel lighthouse tender; bids May 10 Commissioner of Lighthouses, Washington.

Unstated tonnage, steel water tank, Veterans' Hospital White River Jct., Vt.; Chicago Bridge & Iron Works,, Chicago, low, $6680; bids April 13.

Unstated, 7100 feet 20 and 24-inch welded water mains for Salem, Oreg.; bids April 15.

Sheets

Sheet Prices, Page 88

Philadelphia — While consumers generally continue greatly interested in obtaining position on rolling schedules, which now in practically all cases run into third quarter, there is smaller volume of new orders than earlier in the month. This is at least partially attributed, not only to the heavy placing of tonnage in recent weeks, but to the fact that deliveries have become so far extended in a number of lines, that buyers find it increasingly difficult to estimate their own requirements so far in the future.

Moreover, sellers are becoming increasingly interested in prices and have been exerting pressure on sellers for an announcement of third quarter prices. The opinion is that in view of the sold-up condition of the mills, they will likely make an announcement earlier than might otherwise be the case, but some leading producers believe the time is not yet ripe for such announcement. Their position is that too many things can happen in a short time to justify any such action at this time.

Pittsburgh—New business is not as heavy in sheets at present as during some recent weeks, largely because mills are unable to promise quick deliveries. The drop-off has been largely due to automotive specifications. Prices are steady.

Cleveland—Despite anticipated recession in specifications the last few weeks, little improvement has been made in deliveries as new tonnage keeps abreast of production. Most consumrs are apparently fairly well stocked as pressure for early deliveries has eased considerably.

Chicago—Forward buying of sheets is less active, but with mill backlogs extending into August and beyond there is no slackening in operations. While consumption in the automotive industry has expanded, this has resulted in no marked increase in pressure on mills since production of material for plants closed by strikes was continued while operations were suspended and now is reflected in a heavier movement from stock. Producers have had requests to set third quarter prices but defer such action. Deliveries generally lack improvement, with shipments on some grades difficult to obtain before late in third quarter.

Boston—Sheet deliveries are uncertain on most finishes, notably orders placed this month. However, except by some jobbers, buying for next quarter has not been heavy. Delivery on galvanized, copper-bearing and special finishes is low and shipments now being received by most consumers were ordered during the heavy rush to get on rolling schedules last quarter. While some industrial users are operatng close to the border line, few, if any, have actually been forced to curtail production. Strip has replaced slit sheets for some users, contrary to the recent trend.

New York—Sheet deliveries show no improvement but are about maintaining the schedules of the past two weeks. New tonnage is off but not

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The Self-Cleaning, Cam-Type Switch is the heart of the Udylite Rheostat. It operates easily—positively—efficiently under all service conditions. Perfect contact with bus bars is ensured because switch leaves are ground when in closed position. Extra current carrying capacity is provided through ample contact surface and cross-sectional area. The leaves of the self-cleaning cam-type switch are actually multiple cleaning units. The switch in closing causes the leaves to exert a wiping action on the surface of the bus, insuring positive contact at all times and at all points.

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An instrument of precision, the Udylite Rheostat is built to stand the knocks of continuous service in the plating room. Cam-type, self-cleaning switches govern resistors made of helically coiled, nichrome wire. Coil brackets have large radiating surface insuring cool resistor contacts. Instruments —ammeter and voltmeter—are of highest quality obtainable. All metal parts are Udylited for efficient protection.

Udylite Rheostats are furnished for all electroplating processes in standard sizes from 15 to 5000 ampere rating with voltage drops from 1 to 5. Higher voltage drop rheostats are made to special order.

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greatly. There is considerable speculation on third quarter prices with general opinion that coated materials are almost sure to be advanced in view of high prices of coating materials. New prices are not expected before May.

Buffalo—Completion of new sheet capacity and continued troubles of automotive manufacturers appear to have no influence of major character on the market's ability to absorb this material. Mills producing both handmade sheets and strip steel are heavily booked and no slackening of demand has so far appeared to such an extent that reduced output is expected.

Youngstown, O.—Steel sheet consumers continue to press new business upon mills, but with little success because makers are booked practically solidly through second quarter. As for third quarter business, old customers are being continued upon the tonnage allotment system that has been in vogue here since the middle of February. As to third quarter prices, valley mills are giving them little thought until they determine manufacturing costs.

Cincinnati—Sheet mills find some recession in the rate of buying for third quarter, but some heavy tonnage has been placed in order to assure delivery position. Meanwhile rolling schedules are being increased in efforts to meet the delivery situation made more acute by the increasing needs of automobile manufacturers.

Behind the Scenes with STEEL

Verdurous Touch

MAYBE you don't know it, but the American Chain & Cable Co. has gone "green" in a big way. Inspired by Jay O. Lashar, advertising manager, a smashing campaign has been instituted to tie up green with the idea of safety. Two years ago Mr. Lashar decided that "green signifies safety" and set about getting in supplies of green ink to sign letters, green typewriter ribbons, green interoffice stationery and other chlorochrous accessories. Many of the company's products are trademarked in green, and its wire rope has a green strand running through it.

Celebrating the second birthday of his virescent idea, Mr. Lashar sent white carnations artificially colored green to all the company's district offices, and requested salesmen to don a similar carnation a.c.g. in their lapels; this shortly before St. Patrick's day. The idea was to inveigle prospective customers into asking, "Why the green carnation so soon, my good man?", which gave the alert salesmen a golden, or should we say greenish, opportunity to drive into his sales message about ACCO and its official color. In no time at all, he would have an order.

Not only that, but the company's advertising agency—Reincke-Ellis-Younggree(n) & Finn — followed up with a memo to its entire staff which came to work the morning of March 15 to find a white carnation a.c.g. on every desk together with an explanatory note on the client's campaign.

Florists were kept busy this year, we understand, dipping white carnations into green dye to fill rush orders.

* * *

All Neck

WE ARE becoming faintly alarmed at the trend to giraffes in current advertising. No less than three of the necky beasts have come to our attention in the last couple of days. Copy tieup usually has been along the lines of "Tall Doings", "Long Range", "Silent", etc., but there appears to be a little straining on the part of copywriters to get a hook-up.

Working on the "Silent" theme, Philadelphia Gear Works says the giraffe is unique because of its lack of vocal chords, which keeps it in lifelong silence; and further it is also interesting to note that although the giraffe's neck is extraordinarily long, it contains but the usual seven vertebrae.

Recalls our college days when one of the favorite evening pastimes was giraffe parties.

* * *

Hello, Stranger

JAKE SORKIN, treasurer of the Acme Porcelain Enameling Corp., writes us from the Brooklyn division of the company that his boss' wife, Mrs. Jack Freizer, has just blessed evented in Hunts Point hospital in the Bronx. Jake tells us it was a girl, 8 pounds, 8 ounces. Papa, momma and baby are all doing swell. Congratulations. A chip off the old enameler, we suppose.

* * *

Comrades in Steel

WE HOPE you didn't miss that illustration of the stainless steel worker and collective farm girl or "kolkhoznika" in STEEL for April 5. Casual inspection reveals the young man to have a waspish waist more typical of a chorus boy than a worker. The pose of the lad was reminiscent of a bareback rider or slackwire performer; but we suppose the true symbolic effect of the figures misses our capitalistic eyes.

* * *

Mariner

POOR old Lighted Buoy No. 1 in Lake Erie had a pretty rough time of it, this winter. With headquarters normally in Maumee bay outside of Toledo, it succumbed to wind and wave some months ago and started out on a lone trip in the open lake, light flickering bravely. Weeks passed. No word from the missing buoy. Finally the other day it was picked up 30 miles off Buffalo by a lighthouse tender, battered and scarred, its light cold, damp and out after the 200-mile cruise.

Well, buoys will be buoys.

—SHRDLU

Pipe

Pipe Prices, Page 89

Pittsburgh — With outdoor construction gaining, pipe orders are expected to show a gradual pickup. Since April 1 specifications and shipments have been slack compared to March, but the decline is said to be not as extensive as many producers anticipated. Several line pipe projects are nearing announcement and demand from miscellaneous sources continues good. Following the March 20 price announcement in wrought iron pipe, activity has been well maintained.

Cleveland—Jobbers report activity holding at a surprisingly high level despite heavy shipments during March. Most tonnage is absorbed in industrial expansion and repairs, although demand from domestic sources is increasing. Mills continue to operate close to capacity in an effort to rebuild stocks, almost exhausted last month. Specifications for cast pipe are slow to improve, with sales less active than a year ago. James B. Clow & Son Co., Cleveland, booked 135 tons of 4-6-8 inch pipe, for water extension at Springfield, O., purchased by the board of county commissioners, Clark county, Ohio.

Chicago—Cast iron pipe inquiries are slow to develop and business continues slightly behind the rate a year ago. The curtailed volume of work resulting from federal spending to a large extent accounts for the unfavorable comparison between current conditions and those of last year. Some WPA projects are pending but private purchases by municipalities generally are small. Pending pipe line business includes several 4-inch and 6-inch lines for the Great Lakes Pipe Line Co. in the west and southwest.

New York—Cast iron pipe demand has declined, with buying confined mostly to small lots, including 150 tons for the world's fair project. Several large tonnage projects are under consideration, but, like additional New York city yard stocks, will not be up for bids until next month.

Boston — Miscellaneous consumer demand for small-sized steel pipe and tubular material holds well.

Not much large diameter welded steel pipe is moving in this district. Cast pipe buying has improved, as expected at this season, but not in the volume generally estimated. Wrought pipe buying is steady. Most all business in steel pipe and a large part of wrought is moving through secondary channels.

Birmingham, Ala.—Cast iron pipe shops are producing and shipping steadily, with a number of contracts pending. Pipe prices were readjusted when pig iron prices were advanced.

San Francisco—While inquiries are becoming somewhat more numerous the quantities involved are relatively small. Pittsburg, Calif., will hold a bond election on April 22 for $195,000 for the purchase of 6.5 miles of cast iron pipe. Awards totaled 1017 tons, bringing the aggregate for the year to 12,661 tons, compared with 10,639 tons for the same period a year ago.

Seattle—More activity is apparent in this market as new projects are coming out for figures. Unstated tonnages are involved in a 33 mile distribution system for Alderwood Manor, Seattle, bids April 19. Award of 225 tons 4 to 8-inch for Granger, Wash., is pending. About 1000 tons of cast iron are involved in an improvement at Salem, Oreg., bids April 15. Vancouver, Wash., has voted an $850,000 bond issue, of which $600,000 will purchase the local water plant.

Steel Pipe Pending

Unstated tonnage, Great Lakes Pipe Line Co., 6-inch pipe to parallel line from Barnsdall, Okla., to Kansas City, Mo., and 100 mile, 4-inch line from Osceola, Iowa, to Omaha, Nebr., to be replaced by 6-inch line.

Cast Pipe Placed

532 tons, 6 to 20-inch, East Bay municipal utility district, Oakland, Calif.; allocated as follows: 355 tons to United States Pipe & Foundry Co., Burlington, N. J. and 177 tons to American Cast Iron Pipe Co., Birmingham, Ala.

225 tons, 6 and 12-inch, Panama Canal, to United States Pipe & Foundry Co., Burlington, N. J.; $11,664; bids April 13, Schedule 3239.

200 tons, 8 and 10-inch, Brookline, Mass., to Donaldson Iron Works, Emaus, Pa.

170 tons, 6 to 12-inch, Billings, Mont., to unnamed interest.

135 tons, 4, 6 and 8-inch water extension, board of county commissioners, Clark county, O., to J. B. Clow & Sons Co., Cleveland.

102 tons, 4 to 12-inch, South Gate, Calif., to American Cast Iron Pipe Co., Birmingham, Ala.

100 tons, 6 and 8-inch, Sacramento, Calif., to American Cast Iron Pipe Co., Birmingham, Ala.

Cast Pipe Pending

190 tons, 6-inch, Kittery, Maine.

180 tons, 4 to 12-in., Class 150, Santa Ana, Calif.; bids May 3.

120 tons, 6 and 8-inch, water main extension, city of Ravenna, O.

Transportation

Track Material Prices, Page 89

The award of three car orders alone during the past week brought the total within a little more than 200 cars of the 8155 which were placed during the entire month of March. These three orders amounted to 7922 and included 5600 for the Cincinnati, New Orleans & Textile Pacific, a subsidiary of the Southern Railways; 2022 which the Chicago, Milwaukee, St. Paul & Pacific will build in its own shops and 300 cars which the Pennsylvania railroad will build in its own shops, in addition to the 2500 recently noted. In addition the Atlantic Coast Line is expected to announce early award of 400 to 700 freight cars.

On the basis of these items, with 100 ore cars noted last week as

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placed by the Lake Superior & Ishpeming, it would appear assured that the April total will substantially exceed that of last month. The latter railroad had also placed 200 ore cars earlier in the year which were announced recently.

Locomotive buying was featured by the award of 16 by the St. Louis-San Francisco and 11 electric passenger locomotives by the Pennsylvania railroad, with both orders going to railroad shops.

Illinois Central is calling for bids for the purchase of $7,050,000 3 per cent equipment trust certificates, to be dated March 1, 1937, equipment to be bought including 1000 fifty-ton steel hopper cars, 1800 forty-ton steel box cars, 300 refrigerator cars, and 20 passenger train box cars.

Shipments of railroad locomotives during March totaled 30, compared with nine in February, and only one in March, 1936. Unfilled locomotives orders at the end of March were 417, compared with 416 in February, and 95 in March of last year.

New York Board of Transportation will open bids April 22 on 500 tons of rails for the independent subway system and also on accessories.

Car Orders Placed

Cincinnati, New Orleans & Texas Pacific, subsidiary of the Southern Railways, 5600 freight cars awarded as follows: 2000 forty-ton box cars and 250 fifty-ton low-side gondolas, to Pullman-Standard Car Mfg. Co., Chicago; 1250 fifty-ton high side gondolas, to American Car & Foundry Co., New York; 1100 fifty-ton hopper cars to the Pressed Steel Car Co., Pittsburgh; and 500 forty-ton box and 500 forty-ton auto cars, to Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill.

Chicago, Milwaukee, St. Paul & Pacific, 2022 freight cars and 13 coaches, to own shops; freight cars include 1000 gondolas, 500 fifty-ton steel hopper cars and 22 air dump cars; coaches comprise seven diners, five passenger and baggage cars and one mail express car.

Pennsylvania railroad, 300 cement cars, to its own shops at Altoona, Pa.; in addition to 2500 freight cars recently noted as placed; they were included in the company's original inquiry on which carbuilders' bids were asked March 24.

Locomotives Placed

Pennsylvania railroad, 11 electric passenger locomotives, chassis to be constructed in the company's own shops at Altoona, Pa., with electrical parts supplied by electrical manufacturing companies.

St. Louis-San Francisco, 16 locomotives to own shops.

Buses Booked

A. C. F. Motors Co., New York: Twenty-one 41-passenger for Capital Transit Co., Washington; five 30-passenger for Houston Electric Co., Houston, Tex.; six 40-passenger for Boston Elevated Railway, Boston; four 35-passenger for Connecticut Co., New Haven, Conn.; three 35-passenger for Pacific Gas & Electric Co., Sacramento, Calif.

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FEW stop to realize the importance of preventing accidents until after a major occurrence. The expense resulting from one foot accident, including doctor, hospital, compensation and lost time, in a majority of cases is sufficient to purchase fifty pairs of Sankey Foot Guards. The very fact that Sankey's afford maximum protection for so little cost is reason enough for their justification where foot hazards exist. Do not hesitate to take advantage of our 30-day offer. Write for descriptive literature and prices.

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209 Fountain Avenue - - - Ellwood City, Penna.

Strip

Strip Prices, Page 89

Pittsburgh — Many strip mill schedules now are being made up for late June, although in some instances earlier deliveries are obtainable, depending on sizes and quantities. Hot strip specifications have fallen off recently, but such fluctuations are expected occasionally. Deliveries in cold strip continue from six to eight weeks. Resumption of operations by Chrysler and other automobile manufacturers has made shipments heavier. Hot strip is quoted 2.40c, Pittsburgh, and cold strip, 0.25 carbon and under, 3.20c, Pittsburgh or Cleveland.

Cleveland—Strip producers continue at peak operations in an effort to make headway against backlogs that extend well into third quarter. New specifications have declined somewhat as expected, but in many cases still keep abreast of shipments. Small farm tools, electrical equipment manufacturers and auto partsmakers are particularly active. Most are apparently well supplied at least for the present, as pressure for deliveries has declined.

Chicago — New business in strip steel is less active but heavy backlogs keep shipments at an active rate. Automotive users are less insistent on increase in deliveries though consumption is well sustained except in instances where strikes have interfered with production. Producers generally are booked through second quarter though occasionally some extra tonnages can be worked into schedules.

Boston — Continued high mill operations have further reduced first quarter carry-over. More cold strip taken at last price advance is being shipped. Incoming volume holds heavy with deliveries averaging seven to eight weeks. Demand is diversified. Cold-rollers are pressing for deliveries against hot strip contracts, about five weeks on new buying considered good. Builders' hardware, typewriters and automotive parts account for heavy shipments. Some cold strip mills have booked considerable third quarter business at open prices.

New York—Narrow steel strip is still available for second quarter delivery, about the only light flat product in this position. Increasing tonnage is going into electrical household devices.

Youngstown, O.—Closely parallel-

ing the busy mill situations in bars and sheets, strip steel producers continue to scan new business carefully. Production is at high rates but still the output is not nearly great enough to satisfy users.

Wire

Wire Prices, Page 89

Pittsburgh — Demand continues strong, with many customers apparently pinched for supplies and most mills loaded for quarter's balance. Bookings are not well balanced, but this is not unusual. Manufacturers' wire, cold headed material, and spring wire continue in great demand. Rod consumers' stocks are low. One purchaser ordered bale ties in February and is still awaiting delivery. Revision of some prices, such as barbed wire and nails, would not be surprising.

Cleveland — Capacity operations are assured for this quarter and part of next as specifications continue heavy, further extending backlogs on some products. Most mills have space on schedules for nails this quarter, but all other merchant and manufacturing wire products are booked solid. Many producers have cleared up most tonnage booked at the old prices. According to many adjustment in prices for the third quarter is unlikely.

Chicago — Wire mill operations continue full with specifications and shipments heavy. Forward buying is less active following substantial coverage which has largely absorbed second quarter capacity. Movement of merchant products gradually is increasing as consequence of good outlook for farm purchases of fencing, barbed wire, etc. Manufacturer's wire consumption shows no let-up.

Boston—Brisk volume of wire orders continues to be booked. Not only are manufacturers' and spring wire active, but also specialties and electric goods, including cable. Operations continue at capacity in many departments. Heavy wire goods are active. Recession in new business is small and is more evident in jobber products than in other lines. Prices are firm.

New York—Wire mills are not seeking third quarter volume at open prices, although some consumers insist on getting in tonnage for that period. Current buying, while down in spots, is generally well maintained. Heavier goods, including rope, are active. Mill operations are near capacity. New buying of jobber products has eased. Few sellers are willing to venture opinions on possible price revisions next quarter.

Shapes

Structural Shape Prices, Page 88

New York—Taking close to 4000 tons, mostly for shafts, the construction contract for the Queens Midtown tunnel closes May 25. Contract for 55,230 tons of cast iron tunnet rings for the work was placed earlier in the year with United States Pipe & Foundry Co. Additional structural material for schools totals about 2000 tons, following awards for approximately 5000 tons during the last two weeks. While large tonnage projects pending are fewer, inquiries for 200 to 500 tons each are more numerous.

Boston—Structural tonnage placed is heavier. While public work accounts for most contracts, private construction tend to improve. Contractors also appear inclined to close on steel more promptly after getting their awards.

Funds for building the bridge at Deer Isle, Me., taking 1600 tons, have been withdrawn and project abandoned.

Philadelphia — Structural buying so far this month has been confined to relatively small orders, although general volume is expanding and a further increase is expected by April 30. Outstanding recent award involves 1300 tons for a Pennsylvania state bridge at Port Royal.

Pittsburgh—Shape awards continue heavy, last week including a number of projects above 1000 tons. Jones & Laughlin Steel Corp., Pittsburgh, secured 2450 tons for a balcony installation in the transfer building of Ford Motor Co., Dearborn, Mich., and Bethlehem Steel Co. obtained 5200 tons for government air corps shops at Sacramento, Calif.

Cleveland—Mills report backlogs on most structural material extended into June and in many cases

Shape Awards Compared

	Tons
Week ended April 17	28,021
Week ended April 10	48,585
Week ended April 3	20,398
This week, 1936	18,991
Weekly average, 1936	16,332
Weekly average, 1937	28,652
Weekly average, March	28,634
Total to date, 1936	326,735
Total to date, 1937	458,438

Includes awards of 100 tons or more.

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are unable to promise fabricators definite delivery. This makes it practically impossible for fabricators to promise a definite time for completion of a job, except when material can be furnished out of stock. Awards aggregate considerable tonnage but individually they are well under 100 tons. Pending work is the best in some time, despite the heavy buying during the protection period last month.

Chicago—Featuring shape awards is the placing of 5000 tons by Inland Steel Co. for an addition to its open-hearth plants. While other awards generally are small, pending work is accumulating. Several small lots of piling are up for bids. Largest piling projects pending are the Keystone dam in Nebraska, estimated as requiring 10,000 to 15,000 tons, and a Mississippi river dam requiring around 4000 tons.

San Francisco—The outstanding award went to Columbia Steel Co., 2074 tons for three crossings in connection with the East Bay facilities yards of the San Francisco-Oakland bridge. New inquiries are slow.

Seattle—Considerable tonnage is up for figures before May 1, although awards were not heavy. Seattle has called new bids, April 22, under revised specifications, for 5500 tons of galvanized steel shapes for the municipal light plant. Business pending includes 363 tons for the state River Street span at Tacoma, Wash.

Shape Contracts Placed

5000 tons, open-hearth plant, Inland Steel Co., Indiana Harbor, Ind., to Wisconsin Bridge & Iron Co., Milwaukee.

3780 tons, derrick basin, Standard Oil Co., New Jersey, for Venezuela, to U. S. Steel Products Co., New York; American Bridge to fabricate.

2450 tons, balcony installation, transfer building, Ford Motor Co., Dearborn, Mich., to Jones & Laughlin Steel Corp. (Noted in STEEL, April 5, as awarded to J. A. Utley Co., Detroit, general contractor).

2074 tons, three crossings for East Bay facilities yards, San Francisco-Oakland bridge project, Oakland, Calif., to Columbia Steel Co., San Francisco.

1950 tons, building, for Pfaudler Co., Rochester, N. Y., to Leach Steel Corp., Rochester, N. Y.

1525 tons, field house, Purdue University, Lafayette, Ind., to American Bridge Co., Pittsburgh.

1300 tons, state bridge, Port Royal, Juniata county, Pennsylvania, to American Bridge Co., Pittsburgh.

1200 tons, public school, 117 Bronx, N. Y. to Bethlehem Steel Co., Bethlehem, Pa.; Psaty & Fuhrman Inc., N. Y. general contractor.

770 tons, tank building, Pittsburgh Plate Glass Co., Crystal City, Pa., to Stupp Bros. Bridge & Iron Co., St. Louis.

640 tons, grade crossing, Toledo, O., to Bethlehem Steel Co., Bethlehem, Pa.; La Boiteaux, Toledo, general contractor.

550 tons, plant building, Habirshaw Cable & Wire Corp., Yonkers, N. Y., to Harris Structural Steel Co., New York.

525 tons, grade crossing, New York Central railroad, Schenectady, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; Walsh Construction Co., general contractor.

510 tons, state hospital, Dixon, Ill., to Duffin Iron Works, Chicago.

500 tons, transmission towers, Connecticut Power & Light Co., Waterbury, Conn., to Bethlehem Steel Co., Bethlehem, Pa.

475 tons, navy yard, Norfolk, Va., to Virginia Bridge Co., Roanoke, Va., also 30 tons reinforcing bars to Virginia Steel Co., Richmond; William Muirhead Construction Co., Durham, N. C., general contractor.

430 tons, bridge, Rumford, Me., to Harris Structural Steel Co., New York.

410 tons, building, for Benson & Rixon Co., Inc., Chicago, to American Bridge Co., Pittsburgh.

410 tons, building addition, Norton Co., Worcester, Mass., to Eastern Bridge & Structural Co., Worcester.

400 tons, factory buildings, Ken-Rad Corp., Owensboro, Ky., to International Steel Corp., Evansville, Ind.

380 tons, public school No. 169, Brooklyn, N. Y. to Harris Structural Steel Co., N. Y.; Tremont Subway Co., N. Y. general contractor.

360 tons, school, Port Byron, N. Y., to F. L. Heughes Co., Rochester, N. Y.; through Duplex Construction Co., Glensfalls, N. Y.

310 tons, crossing at Green River, Wyo., to unnamed interest.

305 tons, high school, Wellesley, Mass., to Boston Bridge Works, Inc., Cambridge, Mass.; M. Spinelli & Sons, Boston, general contractor.

255 tons, building addition, Connecticut General Life Insurance Co., Hartford, Conn., to Bethlehem Fabricators, Inc., Bethlehem, Pa.

250 tons, manufacturing plant addition, National Can Co., Baltimore, to American Bridge Co., Pittsburgh.

250 tons, warehouse addition, Baldwin Rubber Co., Pontiac, Mich., to Whitehead & Kales Co., Detroit.

250 tons, manufacturing and office building, LaChoy Food Products Co., Detroit, to Taylor & Gaskin, Detroit.

240 tons, three 80-foot plate girder spans, Southern Pacific railroad, Houston Tex., to American Bridge Co., Pittsburgh.

230 tons, addition building 18, General Electric Co. Erie, Pa., to Erie Steel Construction Co., Erie, Pa.

210 tons, Newberry department store, Phoenix, Ariz., to Bethlehem Steel Co., Los Angeles.

200 tons, addition, public school No. 8, New York, to Weatherly Steel Co., New York; Globe Building Corp., New York, general contractor.

200 tons, office and factory building, Thorrez-Maes Co., Jackson, Mich., to Austin Co., Cleveland.

200 tons, miscellaneous work, to Standard Steel Fabricating Co. & Boiler Works, Seattle.

175 tons, junior high school, Sheboygan, Wis., to Fort Pitt Bridge Co., Massillon, O.

165 tons, I-Beams, Reading, Co., Tamatua, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

160 tons, service building, Bethlehem, Pa., to Bethlehem Contracting Co., Bethlehem, Pa.

150 tons, service building, United Engineering & Construction Co., Bethlehem, Pa., to Bethlehem Construction Co., that city.

150 tons, beam spans, Sac county, Iowa, to Pittsburgh-Des Moines Steel Co., Des Moines.

150 tons, Lorain street, theatre, Cleveland, to Builders Structural Steel Co., Cleveland.

145 tons, plant addition, Scott Paper Co., Chester, Pa., to Belmont Iron Works, Eddystone, Pa.

145 tons, building, Cincinnati Shaper Co., Cincinnati, to Pittsburgh Bridge & Iron Co., Pittsburgh.

130 tons, building, Kieckhefer Container Co., Delair, N. J., to Bethlehem Steel Co., Bethlehem, Pa.

117 tons, post office, Wausau, Wis., to Wausau Iron Works, Wausau; also 80 tons reinforcing bars to Concrete Engineering Co., Chicago; Midwest Contracting Co., Minneapolis, general contractor.

115 tons, state bridges, Royalston, Mass.,

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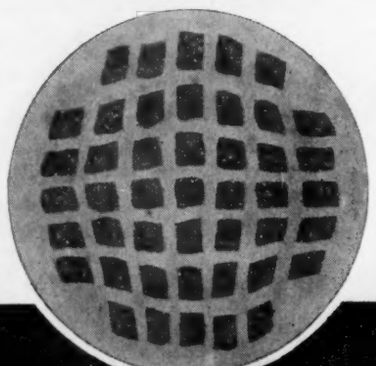

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110 tons, bridge FAP 628-r', Burleson county, Texas, to North Texas Iron & Steel Co. Forth Worth.
110 tons, Billinger overpass, Fort Worth, Tex., to Virginia Bridge Co., Birmingham, Ala.

Shape Contracts Pending

10,000 tons, piling, dam, Keystone, Nebr., Loup river power and irrigation project.
4000 tons, Queens Midtown tunnel; bids May 25.
2200 tons, new public schools Nos. 113 and 68, Manhattan; and addition to public school No. 226, Brooklyn; bids April 20, department of education, New York.
860 tons, two steel truss bridges, Westmoreland-Indiana counties, Pennsylvania; Freeland Inc., Pittsburgh, low.
800 tons, mill buildings, Timken Roller Bearing Co., Canton, O.
615 tons, piling, bureau of reclamation, Potholes, Calif.
600 tons, Summit county, Ohio; bids April 20.
600 tons, plant, Coca Cola Co., Dallas, Tex.
500 tons, track rack for Imperial dam, specification No. 910-D, for United States bureau of reclamation, Potholes, Calif.
500 tons, Lakefront boulevard bridges, Cleveland, Treasury dept. federal government; bids in.
500 tons, state office building, Oklahoma City, Okla.
500 tons, addition to power station, for Central Illinois Light Co., Peoria, Ill.
484 tons, four-span continuous I-beam bridge, Chester and Delaware counties, Pennsylvania; bids to state highway department, Harrisburg, Pa., April 23.
480 tons, through truss bridge, Clearfield county, Pennsylvania; C. G. Thompson, Clearfield, Pa., low on general contract at $124,392.65.
450 tons, store, S. S. Kresge Co., Albany, N. Y.
420 tons, through truss bridge, Cameron county, Pennsylvania; Edwin C. Rarick, Zions Grove, Pa., low at $91,283.49 on April 9 bids.
380 tons, through truss bridge, Beaver county, Pennsylvania; bids to state highway department, Harrisburg, Pa., April 23.
350 tons, decorating building, for Owens-Illinois Glass Co., Streator, Ill.
350 tons, building, for Boyertown Casket Co., Menands, N. Y.
350 tons, grade crossing, New York Central Railroad, Verona, N. Y.
300 tons, bridge, Lehigh Valley Railroad, Ithaca, N. Y.
300 tons, piling, public utility plant, Oklahoma City, Okla.
282 tons, dam, Tomahawk, Wis., Wisconsin Public Service Co.
250 tons, alterations, Eastern high school, Washington; Harwood-Nebel Construction Co., Washington, low. Bids April 13.
250 tons, quartermaster garage, for United States government, West Point, N. Y.
250 tons, grade crossing elimination, for New York Central railroad, Jordan, N. Y.
250 tons, factory building, for Alco Gravure Co., Chicago.
250 tons, building, Fulton Savings bank, Brooklyn, N. Y.
225 tons, ventilation building, George Washington bridge approach, New York; Deriso Brothers Construction Co., New York, low.
200 tons, shapes and bars, Tabor overpass, Montpelier, Vt.; Ryan & Densmore, Claremont, N. H., low.
200 tons, transit shed 5, Albany Port District commission, Albany.
175 tons, Satsop river state bridge, Wash.; bids soon.
170 tons, two-span plate girder bridge, McKean county, Pennsylvania; Baldwin Bros. Paving Co., Cleveland, low at $70,501.79 on April 9 bids.
150 tons, steel sheet piling, bureau of reclamation, Denver, bids April 28, schedule 42228-A.
138 tons, steel truss bridge, Huntingdon county, Pennsylvania; bids to state highway department, Harrisburg, Pa., April 23. Included, 19 tons of plain steel bars.
100 tons, Snoqualmie river state bridge, Wash.; bids at Olympia April 20, also 60 tons of bars.
100 tons, shapes and bars, Procurement division, Treasury department, Harrisburg, Pa.; bids April 21.

Reinforcing

Reinforcing Bar Prices, Page 89

Pittsburgh — Consumers exerted considerable pressure upon sellers recently to have protection periods extended well into the fall, but in many cases have been unsuccessful. Meanwhile, inquiry continues good, with awards under 100 tons unusually heavy.

Cleveland — Reinforcing requirequirements continue well below the level expected by many since the price advance. Mills can make deliveries within three to four weeks, with still further headway expected to be made this month, as pending tonnage is small. Prices remain firm although no real test has recently been offered.

Chicago—Concrete bar shipments remain heavy but new business is slow to increase. State road building is productive of only small lots of concrete bars, due to the type of construction now employed.

New York—With reinforcing contracts approximating 2000 tons, in-

Concrete Awards Compared

	Tons
Week ended April 17	6,694
Week ended April 10	4,727
Week ended April 3	3,570
This week, 1936	4,875
Weekly average, 1936	6,005
Weekly average, 1937	4,170
Weekly average, March	5,402
Total to date, 1936	117,499
Total to date, 1937	66,712

Includes awards of 100 tons or more.

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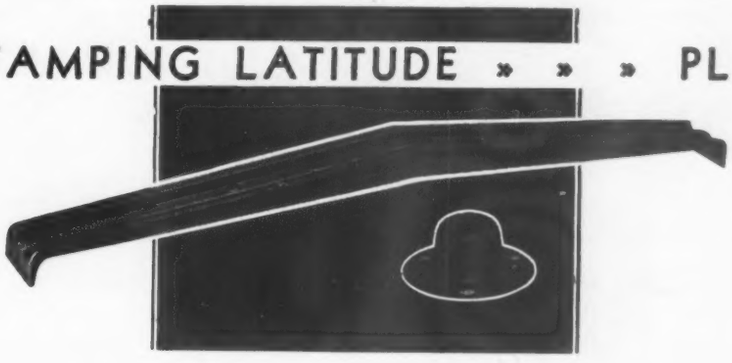

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quiry is also substantially heavier led by 2400 tons for a Flushing river bridge, New York, on which the Corbetta Construction Co., New York, is low. Bids close May 25 on construction of tunnels and shafts, Queens Midtown tunnel. New York state highway work, part of which is to be bid this week, is heavier. Reinforcing bar prices continue to be shaded materially.

Philadelphia—Reinforcing bar buying continues featureless, with orders largely of lots of 50 tons and less, and with little immediate inquiry involving larger tonnages. While lacking any particular test, billet steel bar prices appear the strongest in a long time.

San Francisco—Awards were the second largest for any week this year totaling 5323 tons, bringing the aggregate to 26,255 tons, compared with 75,770 tons last year. Featuring the lettings were 2114 tons for the bureau of reclamation, Potholes, Calif., placed with Judson Steel Corp. The Bureau of Reclamation has just opened bids on 1451 tons for delivery at Odair, Wash. The volume of new business in sight is not as large as it was two months ago, as most of the new inquiries are comprised of small tonnages.

Seattle—Demand for concrete bars is not coming out in volume, small awards, less than 100 tons, feature the market. Mills have sufficient backlog to carry them into next month. Merchant bars are slow, as dealers placed their requirements before the price advanced.

Reinforcing Steel Awards

2114 tons, bureau of reclamation, invitation A-42,211-A, Potholes, Calif., to Judson Steel Corp., Emeryville, Calif.

1000 tons, four laboratories, California Institute of Technology, Pasadena, Calif., to Soule Steel Co., Los Angeles.

860 tons, tire plant, Ford Motor Co., River Rouge, Mich., to Truscon Steel Co., Youngstown, O.

350 tons, building, Habirshaw Cable & Wire Corp., Yonkers, N. Y. to Truscon Steel Co., Youngstown, Ohio.

330 tons, state viaduct, Tacoma, Wash., and airplane assembly plant, Seattle, to Bethlehem Steel Co., Seattle.

300 tons, six story addition, Federal building, Vesey St., N. Y. to Igoe Bros., Newark; Millimet Construction Co., Union City, New Jersey, general contractor.

250 tons, warehouse, for Union Supply Co., Pittsburgh, to Lind Co., Pittsburgh.

200 tons, stockhouse, Schaefer Brewing Co., Brooklyn, to Bethlehem Steel Co., Bethlehem, Pa.; George A. Fuller Co., general contractor.

175 tons, miscellaneous work, Pennsylvania railroad, Newark, N. J. to Igoe Bros., Newark.

160 tons, crossings, East Bay facilities yards, San Francisco-Oakland bridge project, Oakland, Calif., to Concrete Engineering Co., San Francisco.

160 tons, bureau of reclamation, proposal 42670-A, delivery Phoenix, Ariz., to Concrete Engineering Co., Omaha, Nebr.

150 tons, junior high school, Sheboygan, Wis., to Concrete Engineering Co.

125 tons, Masonic temple, Fresno, Calif., to Kyle & Co., Fresno, Calif.

110 tons, public school 253, Brooklyn, to Bethlehem Steel Co., Bethlehem, Pa.; Reiss & Weinseir, Inc., Brooklyn, general contractor.

110 tons, building addition, Wilson Co. Brooklyn, to Igoe Bros., Newark, White Construction Co., general contractor.

100 tons, highway project, Connecticut, to Truscon Steel Co., Youngstown, O.; Mariani Construction Co., general contractor.

100 tons, bureau of reclamation, invitation 24,549-A, Potholes, Calif., to unnamed interest.

100 tons, alterations to high school, Taft, Calif., to unnamed interest.

Reinforcing Steel Pending

2400 tons, bridge, Flushing river, New York, Corbetta Construction Co., New York, low.

1600 tons, bureau of reclamation, Odair, Wash.; bids opened.

1400 tons, Queens Midtown tunnel, New York; bids May 25.

600 tons, dam No. 25, Mississippi river, Cap au Gris, Mo., bids due May 11.

391 tons, Treasury department, schedule 24,833, Los Angeles; bids opened.

275 tons, footings for transmission towers, Seattle light department; bids April 22.

200 tons, bridges, World's Fair site, New York.

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226 tons, state highway work, McKeesport, Pa.; bids to state highway department, Harrisburg, Pa., April 23.
225 tons, highway project, Warsaw, N. Y.
175 tons, highway and bridge, Jacob Riis Park, Queens, N. Y.; bids April 20.
140 tons, high school, Ellensburg, Wash.; bids April 19.
130 tons, bridge, St. Annes Avenue, New York; bids in.
110 tons, bridge, Willetts Avenue, New York; bids in.
103 tons, through truss bridge, Beaver county, Pennsylvania; bids to state highway department, Harrisburg, Pa., April 23.
100 tons, four-span I-beam bridge, Chester and Delaware counties, Pennsylvania; bids to state highway department, Harrisburg, April 23.
100 tons, addition to livestock building, San Francisco; bids opened.

Pig Iron

Pig Iron Prices, Page 90

New York—Export inquiry for pig iron has taken a new spurt, with one inquiry calling for 70,000 tons, principally foundry iron, and another involving more than 40,000 tons, principally 1X foundry. These inquiries have been issued through brokers and are apparently for European consumers; in addition there are a number of other smaller inquiries, several of which have been issued direct by consumers.

It is difficult to estimate the total amount pending in view of the possibility of some overlapping. However, it appears safe, according to some trade loaders, to estimate foreign inquiry at more than 125,000 tons. Precisely how much of this is strictly bonafide is also difficult to gage. Japan, apparently, is not active, at least as far as surface indications go. It is said that ocean freight rates have increased within the past couple months or so from around $7 to more than $13 and that shipping space is increasingly scarce.

New domestic inquiry is light, but consumption continues heavy against contracts. The sold-up condition of a number of large furnaces is making it difficult for them to figure on European business, incidentally, especially as foreign buyers are asking for delivery in many cases within three months.

Some new production is expected shortly, with the Troy, N. Y., Riddlesburg, Pa., and the Everett, Mass., merchant stacks all likely to resume operations around May 1 or shortly thereafter.

Pittsburgh—Pig iron producers report shipments continuing ahead of output and from all indications this month's deliveries should come close to the March total. Some consumers are still on a ration basis, while others, despite the fact that they have stocks, are taking their usual quotas. Advances in coke prices were taken into consideration by pig iron producers at the time of the last price increase, and it is unlikely that action toward any further advance would be initiated in this district, but some sellers would not be surprised at an announcement of an advance emanating elsewhere.

Cleveland — Although merchant sellers are accepting some spot tonnage for delivery this quarter, backlogs assure close to capacity melt for the next two months. The slight decline in new business is welcome in some respects, as stocks are well below normal. Most foundries have contracted for enough tonnage to satisfy immediate requirements, but some find they have underestimated needs.

Chicago—Pig iron shipments are well ahead of the corresponding period of last month but show the anticipated slackening from the March rate which was stimulated by the closing out of contracts. New

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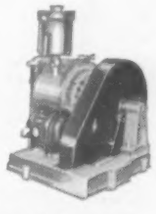

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business continues in fair volume but most foundries now have covered their forward needs and small lots for fill-in purposes are expected to constitute most of the new buying. Stocks of producers are light.

Boston—Pig iron buying is mostly in small lots for second quarter delivery. While a few consumers have inquired as to third quarter tonnage, no sellers are known to have sold beyond this quarter. Melt continues heavy. The larger consumers generally have sizable stocks and some of the moderate-sized foundries have much more iron stocked than in recent years. The Everett, Mass., furnace is expected to go in blast soon.

Buffalo—Pig iron production will taper the coming week on account of drawing a merchant stack for relining. This stack, which has had one of the longest runs in its history, will be down for about six weeks. There also is a possibility a steelworks furnace may have to be withdrawn soon for a like reason. April shipments have been a surprise to producers, who had expected the heavy deliveries in March would be followed by a decline in movement. There has been a heavy outbound movement of iron by lake and canal with much more tonnage scheduled to be loaded in the next four or five weeks.

Philadelphia—Movement of pig iron against contracts is being maintained in substantial volume, with spot buying, however, light. There is less indication than a fortnight ago of a further early increase in pig iron prices. In fact, some trade interests now look for no change for at least a few weeks.

Cincinnati—Buying of pig iron is restricted to scattered carloads. Foundries, although operating near capacity, are well stocked with cheaper iron, shipped during first quarter. With a few exceptions, contracts are cleaned up.

St. Louis—While shipments of pig iron continue at a high rate, new business is light, mostly carloads. Most melters have already bought their requirements for second quarter, placing their orders before recent price advances.

Birmingham, Ala.—There is warrant for continued active production of pig iron and the output is above the record since 1930. Consumers have not shown that recent advances in cost of iron will interfere with consumption.

Toronto, Ont.—Despite labor troubles during the past week demand for merchant pig iron continues heavy. Melters are showing keen interest and there is a steady flow of orders from 100 to 500 tons, for spot delivery. A number of melters have covered for second quarter. Sales now are approximately 2000 tons per week with foundry iron in excess of 1000 tons. Production is at a high level and prices are firm and unchanged.

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Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 89

Specifications for bolts, nuts and rivets are less active following heavy demand before April 1 in closing out contracts. Shipments of such tonnages are keeping producers well occupied, however, and consumption also is well maintained. Jobbers' stocks are being increased though a heavy call continues from miscellaneous users and a resumption of jobber specifying is looked for soon. Railroads and car shops are moving material promptly into consumption. A similar situation exists among farm implement and tractor manufacturers. Prices show a stronger tone than during the past several years.

Scrap

Scrap Prices, Page 92

Philadelphia — A sharp decline is noted in scrap prices, with unsettlement due to a combination of factors, including easing in demand of finished steel orders, agitation in export embargoes and the psychological effect of President Roosevelt's declaration earlier in the month that commodity prices are too high. Even cast scrap, which has been particularly strong, has succumbed to weakness.

Foreign offerings also have been reduced, not only by dealers in covering on back contracts but by consumers on the other side in negotiating for new tonnage. This latter development is contrary to some trade expectations. It had been assumed that foreign buyers, in view of the threatened embargo on scrap from this country, would step up their quotations in an effort to get as much material as possible before the curtailment might take place.

Apparently, these buyers are as yet none too apprehensive over this possibility, and, moreover, being duly advised of the general weakness in the scrap markets here they are endeavoring to take advantage of this situation. The general trade opinion is that prices will probably go lower before again turning upward. Generally speaking, there are more sellers than there are buyers today.

Formation in Europe of a scrap buying cartel by steel mills in Italy, England, Germany, Poland, Holland, Czechoslovakia, Yugoslavia, Sweden, Hungary and Poland is also a factor in lower export offerings.

Pittsburgh—Scrap has been at a standstill here during the past week, with No. 1 heavy melting steel at $22.50 to $23 per ton. No mill sale of any consequence has been reported. Steel specialties are still strong and in good demand by foundries. With mill operations at 95 per cent of capacity, considerable scrap is being consumed and this has led many dealers to believe that buying will be resumed soon.

Chicago—Scrap prices tend toward weakness, and absence of mill buying leaves consumers' quotations nominal. Sellers are able to pick up heavy melting steel as low as $20 but a definite indication of the market awaits resumption of mill purchasing. Offerings of country mixed scrap have been heavy but the supply of No. 1 industrial and railroad grades has increased only moderately. Some specialty items remain strong, due to scant supplies.

Boston—Prices on several grades of scrap are easier, notably for domestic shipment, f.o.b., cars. Borings, turnings, and several cast grades are lower, 50 cents a ton in a few instances. Prices paid for export, dock delivery, are relatively steady, due to buying against contracts. Sentiment in the domestic market is less buoyant, however.

New York—Except for steel shafting practically all grades of scrap for domestic consumption have declined 50 cents per ton. Buying is light. A spread of $150 has developed between the two grades of heavy melting steel for dock delivery.

Buffalo — A temporary halt has been called in scrap dealings due to the sudden drop in the purchase offer of the largest local melter. After buying tonnage on a rising market for several months this consumer dropped its bid when other markets weakened. It is reliably reported local melters sold as much as 20,000 tons of No. 1 heavy melting steel at $21.50 to $22 before the bid was reduced to $20. Some deal-

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ers had been paying $19.50 for on track No. 2 steel for shipment on contracts, indicating that higher prices had prevailed here than had been admitted.

Detroit—Softening in the scrap prices has brought declines of 50 cents to $1 per ton, with likelihood of further reductions. Increased supplies from plants recently strike-bound are having an effect. Country scrap is appearing in large supply.

Cincinnati—Heavier offerings of iron and steel scrap, coincident with the check in the upward price trend, has caused another cut in dealers' buying prices. Offerings, so limited in recent weeks, are more than adequate to meet current consumer demand. Mills are taking in scrap steadily without additional tonnage commitments. Foundries continue active buyers.

St. Louis—Although local conditions seem adverse, the market for scrap continues steady, with no changes in prices. Country dealers are offering supplies in increasing tonnage, and mills are making no new commitments as their yards are congested.

Birmingham, Ala.—The scrap market continues strong with dealers capable of meeting demands promptly. Heavy melting steel is held above $15.50 per ton. The market has not been out of bounds because of inability to participate in any outside demands.

Seattle—Competition is keen between exporting and domestic interests, the former buying on a basis of $12.75 gross, well under the eastern market. Japanese importers are offering from $22 to $25, c.i.f., involving freight charges of $10 to $12 a ton. If steamship space were available demand from the Orient would adjust tidewater prices to world levels.

Toronto, Ont.—Practically no change has appeared in the scrap market. Consumers are pushing dealers for supplies, but the latter are having difficulty in filling orders. Montreal dealers also report active demand for steel grades. Foundries are taking larger tonnages of pig iron to offset scarcity of machinery cast and other iron grades. Stove plate has a ready call with supplies limited. The sharp increase in demand for scrap in recent months has resulted in shortage in most yards and dealers now are tapping every known source for new stock but with limited success.

Cold Finished

Cold Finished Prices, Page 89

Pittsburgh—With deliveries ranging from six to eight weeks in some sizes, cold-finished bar sellers are busy, attempting to meet demands of farm implement manufacturers, automotive partsmakers, printing press builders and other diversified users. Partsmakers, anticipating heavy May and June assemblies, have increased their parts banks. Cold-finished carbon bars are quoted 2.90c, Pittsburgh.

Warehouse

Warehouse Prices, Page 91

Cleveland — Warehouse distributors report little decline in general demand, particularly in sheets, strip and plates. More consumers are coming to purchase part of their requirements from warehouses, due to extension of mill deliveries on most products. This condition makes some believe that most consumers are not too well stocked, despite heavy mill shipments the last two months.

Chicago—Sales are slightly heavier but April business to date has lagged behind the rate a month ago, due to heavy buying which preceded price advances early in March. Warehouses are being forced to turn down business in some products, due to inadequate stocks. Sheets are prominent in this respect.

Boston—Demand for warehouse steel continues heavy, holding well up to last month's high rate. Considerable volume from small-shipment industrial consumers, unable to obtain delivery promptly from mills, has been diverted to warehouses. Mills also are making special efforts to cover regular jobber customers in most cases. Prices are firm and unchanged with demand diversified.

New York — Warehouse volume continues heavy with practically no recession from March rate. Fast turnover and slow deliveries handicap some jobbers in keeping balanced stocks. Practically all smaller specialty and miscellaneous steels are now in line with new prices on major products.

Philadelphia—So far this month warehouse business has been maintained at a rate comparable to corresponding period in March, one of the best months in recent years. Distributors hesitate to predict April will be as good, notwithstanding gratifying showing so far. An element of hesitancy is noted in the steel market which may make itself more pronounced in the jobbing market. Prices are firm.

Cincinnati — Warehouse demand, although below March, is considerably higher than April, 1936. Sales of plates have spurted because of mill delays, teaming with sheets as volume leaders. Prices are strong and unchanged.

St. Louis—Warehouse business continues to keep pace with March, which gave the largest volume since the depression, approximately double March, 1936. Sheets constitute the bulk of buying, because of the extended deliveries by mills. Plates also are in strong demand.

Seattle—Sheets continue to lead the market, with buying confined to immediate needs. In view of increased prices and uncertain deliveries there is little forward buying.

Iron Ore

Iron Ore Prices, Page 92

Cleveland — Two vessels of the Cleveland-Cliffs fleet pushed free of ice in Whitefish bay into Lake Superior, arriving at Duluth late Thursday. The freighter E. J. KULAS, of the Wilson Transit fleet, wintering at Duluth, was the first vessel to take on ore at that port, and is expected to arrive at lower lake ports early this week.

The first cargo of iron ore from Escanaba arrived at lower lake ports Saturday. The steamer PAM SCHNEIDER of the Schneider Transportation Co., with a cargo for the Struthers Iron & Steel Co., Struthers, O., left Escanaba, Mich., April 11.

The tonnage was shipped by the North Range Mining Co., Negaunee, Mich., consigned through its Cleveland agent, Lee E. Ives Inc. Thirty-four vessels loaded with coal left Toledo harbor last week, a record number for the opening of the season. The Lake Superior Iron Ore association reports the following receipts at lower lake ports, shipments therefrom for the season and dock balance April 1.

Port	Receipts	Shipments	Dock bal. Apr. 1,'37
Buffalo	3,792,759	83,262	1,201
Erie	1,536,884	1,558,847	42,715
Conneaut	6,773,428	7,283,402	1,180,974
Ashtabula	4,479,943	5,466,625	711,046
Fairport	898,389	900,874	390,923
Cleveland	9,061,815	7,463,354	280,396
Lorain	2,677,341	1,292,560	3,871
Huron	704,976	839,387	202,000
Toledo	1,505,485	822,919	38,825
Total	31,431,020	25,711,230	2,851,951
Year ago	19,907,228	14,615,452	4,734,146

Semifinished

Semifinished Prices, Page 89

Semifinished producers continue in an extremely tight situation, with demand heavy from all sources, including advantageous offers for export. Some sellers, unable to make promises for months ahead, constantly are running into difficulties

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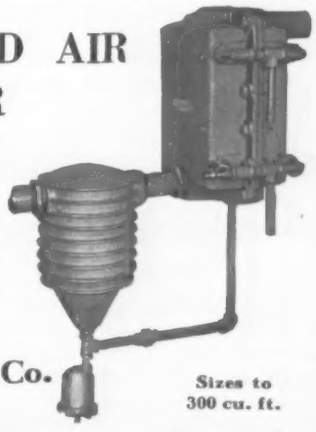

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in attempts to apportion tonnage to accommodate certain consumers. Forge shops generally are reported hard put to obtain steady and adequate tonnages. Sheet bars continue in great demand, with rerolling billets and wire rods eagerly sought. The rerolling billets, sheet bars, blooms, and slabs are quoted $37, Pittsburgh; wire rods $47 and $52, and skelp, 2.10c.

Tin Plate

Tin Plate Prices, Page 88

Pittsburgh—With canmakers cutting up considerable tin plate, shipments are increasing and operations continue at their high rate. Every mill is completely booked until Sept. 30, but despite that fact demand continues strong from many sources, including export. Most of the business being under contract, it is expected that these will be utilized to the fullest extent in view of the recent advance of 50 cents per base box, which raised the coke tin plate price to $5.35, Pittsburgh.

Ferroalloys

Ferroalloy Prices, Page 90

New York—Reversing the trend of several months ago, foreign inquiries are now appearing here for ferromanganese. Most are from Europe and are regarded more or less as "feelers"; one inquiry is from Australia and involves 1000 tons. Local sellers believe there is little likelihood of European inquiry, at least, developing into actual business, as prices here at $95 duty paid, seaboard, are anywhere from $15 to $20 above the going European market, a difference to which must also be added an ocean freight rate of $5 or $6.

However, the European market is stiffening rapidly and this is being reflected by the withdrawal of sales offers in this market. With the European market at least $75, according to trade interest here, and with an import duty of $17.92, plus a freight rate of at least $5, to say nothing of commissions likely to be involved, European ferromanganese for consumption here amounts to at least $5 or so over the domestic market.

Metallurgical Coke

Coke Prices, Page 89

Advances of 50 cents a ton have been made on beehive furnace and foundry coke for spot shipment as a result of the recent mine wage increase. Connellsville furnace coke is now $4.60 to $4.75; Connellsville foundry, $5.25 to $5.50; Connellsville premium foundry, $6 to $6.50; and New River foundry, $6.50 to $6.75. On shipments being made last week the wage clause was not yet applicable, but it was expected that the advance would be 35 to 40 cents a ton. Producers have been unusually busy, attempting to fill demands confronting them on all sides. Several coal mines, including the Simpson mine of the Whyel Coal Co., idle for nearly ten years, will be reopened to supply coal for manufacture of coke.

Steel in Europe

Foreign Steel Prices, Page 91

London — (*By Cable*) — Steelmakers of Great Britain established another alltime high production record for steel ingots and castings in March with output of 1,109,500 gross tons, a gain of 223,900 over February, a much shorter month. The March production betters the former record of 1,060,500 tons, established in October, 1936. In each of the last four months of 1936 Great Britain made more than 1,000,000 tons of steel, the first period in which such a mark had been reached. The daily rate of output in March was 41,463 tons and in February, 41,495 tons.

Pig iron production in March was 680,300 gross tons, compared with 603,700 tons in February, a gain of 76,600 tons. The daily rate in March was 21,945 tons, compared with 21,560 tons in February. Active stacks at the end of March numbered 117, at the end of February, 115.

March imports of steel were 94,281 tons, exports 231,557 tons, compared with 82,896 tons and 200,498 tons, respectively, in February.

Tightness in the steel industry of Great Britain has not been relieved and most furnaces and steelworks refuse spot business. Some time contracts are being booked at prices ruling at time of delivery. An increase of prices is expected during May, with most products affected. The general shortage of steel continues and deliveries of semifinished steel from the Continent remain inadequate. The Continent reports export demand continues without abatement.

Nonferrous Metals

Nonferrous Metal Prices, Page 90

New York — Uncertainty in nonferrous metal market early last week developed into pronounced weakness on Friday when quotations dropped sharply on the London Metal Exchange. Price declines were attributed to heavy liquidation of speculative holdings which uncovered stop-loss orders and to the lack of consumer buying support.

Copper — Domestic primary mine producers lowered their prices to the basis of 15.50c, Connecticut, for electrolytic. Supplies of nearby metal continued tight as indicated in the bullish March statistics.

Lead—Demand was fairly active with prices holding at 5.85c, East St. Louis.

Zinc—Prime western held at 7.00c, East St. Louis. Offerings exceeded demand despite continued light supplies.

Tin—Buying increased on Friday as prices dropped to 58.50c on Straits spot.

Equipment

New York—Machine tool price advances of 10 per cent and in some instances more have become general following increase in forging hammers two weeks ago. Sellers generally allow customers ten days to close pending orders at old prices, resulting in new heavy volume. More builders are inserting contract clause specifying advances up to 20 per cent after due notice before shipment beyond three to four months. Deliveries are further extended and one large New England producer is reported to have withdrawn prices.

Chicago—Machine tool sales continue heavy and for some sellers April gives indications of being the best month so far this year. Recent price increases to a certain extent have aided business since a number of contracts were closed just before new prices became effective. Demand continues well scattered, with railroad buying an important factor. The Burlington, Chicago & North Western, and Union Pacific railroads have placed additional orders against outstanding lists. New inquiries from railroads include only a few items at a time. Demand for small tools continues brisk.

Cleveland — Tempo of the machine tool market was slower in this district last week although demand for single machines and used tools continued in fair volume. Deliveries remain a serious problem. Local builders generally have heavy backlogs. A few builders are booking orders with provisions for 12½ to 20 per cent higher prices if conditions at time of delivery warrant. This practice has not become general.

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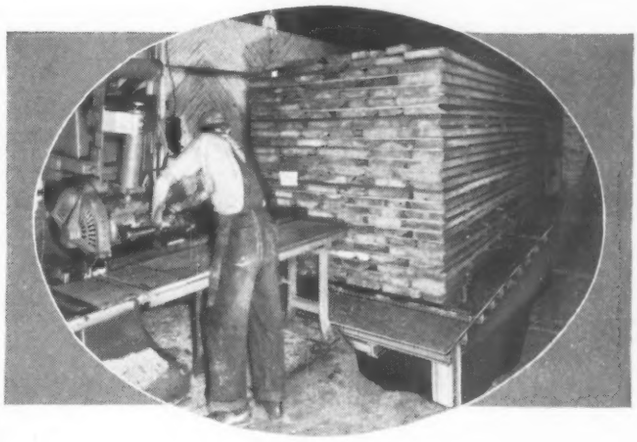

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Ohio

BEDFORD, O. — Bids will be opened April 23 for sewage treatment plant, PWA project, estimated cost $140,610. R. F. MacDowell, Chester-12th building, Cleveland, is engineer.

BOWLING GREEN, O. — City plans to install new filter beds in sewage disposal plant at cost of $78,000; project dependent on PWA approval. Smith Niles, 112 E. Woodruff street, Toledo, is consulting engineer.

CIRCLEVILLE, O. — City plans to build sewage disposal plant as PWA project at cost of $136,363. Plans will be available June 15. Floyd G. Browne, Marion, O., is consulting engineer.

CLEVELAND — Jaeger Machine Co., 777 Rockwell avenue, plans $40,000 alterations to former Lakewood Engineering Co. plant on Berea road.

CLEVELAND — American Rivet & Mfg. Co. has been incorporated by J. Emmet Weiler and associates. Deihel, Price, Elbrecht & Roberts, Standard building, are correspondents.

CLEVELAND — Moslo Machinery Inc. has been organized by Marie Lee Kearns, William Bruce Laporte and Ernest P. Moslow, William Bruce Laporte, 4500 Euclid avenue, is correspondent.

DAYTON, O. — Office of contracting officer, Wright field, will receive bids until May 3 for one vertical electric furnace for carburizing and miscellaneous heat treatment, circular 37-668, for delivery Wright field. Major E. T. Kennedy is contracting officer.

GALION, O. — City plans to remodel sewage disposal plant as PWA project; cost estimated at $80,000. P. A. Uhlman, 2083 Dayton street, Columbus, O., is consulting engineer.

GEORGETOWN, O.—Village board of trustees, Fred Kellum, clerk, will close bids April 23 for cast iron pipe and special castings required for waterworks treatment plant.

MONTPELIER, O. — Northwestern electric co-operative Inc. will receive bids April 26 at Pure Oil building, Columbus, O., for construction of 277 miles transmission lines in Williams county; estimated cost $275,000. Carl Frye, Pure Oil building, Columbus, is engineer.

PORTSMOUTH, O.—City plans to improve waterworks at $210,895 cost, dependent on WPA approval. Charles Stevenson is city engineer.

SHARONVILLE, O.—Village will apply for federal aid in financing construction of sewer system and disposal plant, estimated to cost about $100,000. Harry McGrew is mayor.

STOW, O.—Village has tentative plans for construction of water supply system to cost $130,000. George Emery is chairman of water committee.

WELLSVILLE, O. — City will seek PWA grant to improve waterworks, install filtration plant, enlarge reservoir, build standpipe and buy meters; total cost $140,000. R. H. Hunter, Wooster, is consulting engineer.

WESTERVILLE, O.—City will close bids April 23 on cast iron pipe, 4200 feet 4-inch and 2100 feet 8-inch, in 12, 16 or 18-foot lengths, and other equipment. R. E. Windom is city manager.

Michigan

ADRIAN, MICH. — Lenawee county rural electric co-operative, Inc., has federal approval of project to construct 655 miles transmission lines and power plant, estimated cost $630,000. E. Cyril Bevan, 2379 National Bank building, Detroit, represents cooperative.

BATTLE CREEK, MICH. — U. S. Register Co., 344 East Burnham street, has awarded general contract for construction of boiler room to F. J. Skidmore & Son, Battle Creek. Cost is estimated at $22,000.

BAY CITY, MICH.—Nichols-Foss Packing Co. plans construction of steam power house, 40 x 60 feet, at new packing and canning plant. Cost is estimated at $80,000.

BERRIEN SPRINGS, MICH. — Village is having private plans prepared for construction of $20,000 sewage disposal plant. PWA project.

DEARBORN, MICH. — Ford Motor Co. has awarded contract for construction of its tire plant, here, to O. W. Burke Co., 1010 Fisher building, Detroit. Albert Kahn Inc., Detroit, is architect.

DETROIT — Department of public works is taking figures on construction of seven sewage regulation chambers. Bids are due April 20.

DETROIT — Tucker Stamping & Mfg. Co., 5460 Heckla avenue, has been incorporated to manufacture stampings, by Alfred B. Tucker, Detroit.

FLINT, MICH. — Genesee Radio Corp. has been formed by Howard M. Loeb, 613 Clifford street, to construct radio stations.

GLADSTONE, MICH.—City will submit plans soon for construction of $105,000 electric light and power improvement project.

KALAMAZOO, MICH. — Imperial Beverage Co. will erect office and warehouse building, estimated to cost about $20,000, Stewart Kingscott Co., Kalamazoo, is architect.

MUSKEGON, MICH. — Vento Steel Products Co. has awarded general contract for construction of factory addition to Muskegon Construction Co., here. E. E. Valentine, Muskegon, is architect.

PONTIAC, MICH. — Pontiac Motor Co. is having $15,000 factory addition built by the Austin Co., Detroit.

WYANDOTTE, MICH.—Firestone Tire & Rubber Co., Akron, Ohio, plans erection of power plant at tire plant near here.

Connecticut

BRIDGEPORT, CONN. — Bridgeport Brass Co., East Main street, plans installation of conveyors, hoists and other equipment at addition to brass, bronze and copper products plant here. Stone & Webster Engineering Corp., 49 Federal street, Boston, Mass., is consulting engineer.

New Hampshire

MANCHESTER, N. H. — Cohen Machinery Co., has purchased former No. 4 Canal building, south, from Amoskeag Mfg. Co. and plans expansion.

New York

LACKAWANNA, N. Y. — Holtro Chemical Co. has leased 15,000 square feet of floor space on Maple avenue for plastics production.

Pennsylvania

ERIE, PA. — Pennsylvania railroad will spend $600,000 in modernizing and enlarging ore dock. Franklin D. Davis, Buffalo, is general superintendent, Buffalo division.

PITTSBURGH — U. S. Engineer, Federal building, Pittsburgh, will receive bids until April 28 for two locomotive type cranes for Emsworth lock and dam, Ohio river.

Illinois

CHICAGO—Brandewein Co., 2349 South State street, plans construction of improvements to steam power house at mattress factory. Entire project, including plant addition, will cost about $100,000. A Epstein, 4001 West Pershing road, is engineer.

EAST ST. LOUIS — Key Co., 2700 McCasland avenue, will build foundry addition costing $500,000. Fred Key is vice president and general manager.

Indiana

EVANSVILLE, IND.—Acme Tool & Die Co. Inc., 823 East Virginia avenue, has been incorporated to manufacture tools, dies and fabricated metal products, with 1000 no par shares, by W. H. Schacke, resident agent, Robert Fawcett and Marvin B. Norman.

INDIANAPOLIS — Indiana Tool & Engineering Co. Inc., 1109 North Hamilton avenue, has been formed to manufacture tools, dies and jigs by Ray Hellmer and associates. Hellmer is also resident agent.

INDIANAPOLIS—Hoyt Machine Co., 1925 Massachusetts avenue, has been incorporated to manufacture screw machine products, with 500 first preferred $100 par shares, 50 second preferred no par shares, 1000 common $1 par shares, by Fred W. Sommer, Kurt F. Pantzer and Gustav H. Dongus.

WABASH, IND. — National Machine Co. Inc., 166 Stitt street, has been organized to manufacture and sell machinery, by Clifton C. Frame and associates.

Maryland

CUMBERLAND, MD. — Potomac Edison Co. has authorized construction of $3,000,000 addition to electric power plant, a 30,000 kilowatt unit. R. Paul Smith, Hagerstown, Md., is president of board.

HAGERSTOWN, MD.—City plans airplane hangar and office building, 100 x 100 feet, brick and steel. W. Lee Elgin is mayor.

OCEAN CITY, MD. — State legislature has passed bond bill providing $750,000 for construction of bridge over Sinepuxent bay.

TOWSON, MD. — County commissioners will receive bids April 26 for excavating trenches, furnishing and laying 52,200 feet of 6-inch to 16-inch cast iron water mains and appurtenances in right-of-ways of Reisterstown road. Samuel A. Green, Towson, is engineer.

District of Columbia

WASHINGTON — Bureau of supplies and accounts, navy department, will re-

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ceive bids until April 20, schedule 412, for electric vertical single-cylinder boring machine for delivery at Portsmouth, Va.; until April 27, schedule 437, for a toolmaker's engine lathe for delivery at east or west coast points.

Texas

GALVESTON, TEX. — United Fruit Co. will build new banana discharge terminal to cost $300,000. Henry Bougon, Los Angeles, is equipment superintendent.

GLADEWATER, TEX.—General American Oil Corp. of Texas, Slattery building, Shreveport, La., plans to enlarge gasoline plant at cost of $200,000.

GREENVILLE, TEX. — Hunt Collins Electric Co. allotted $170,000 by REA to construct 183 miles power lines in Hunt, Collin and Fannin counties.

HOUSTON, TEX. — Dixon Packing Co., 108 Milam street, plans erection of boiler plant at food products factory here, at a cost of about $150,000. S. F. Dixon is president.

Wisconsin

MANITOWOC, WIS.—Board of education closes bids April 22 for furnishing complete laboratory, drafting room and other equipment for new $1,000,000 high school. Katherine Trastek is secretary.

MILWAUKEE—Board of school directors, F. M. Harbach, secretary, closes bids April 29 for new boiler room, fuel room, conveyors, etc., at North Thirty-seventh street grade school.

MILWAUKEE—A. Cohen & Sons, scrap metal dealers, 1231 North Fifth street, have started work on new office building including storage for nonferrous material, estimated to cost $20,000.

NEENAH, WIS.—Neenah Foundry Co. is building addition, 30 x 30 feet, for welding and repair shop, and enlarging warehouse.

PHELPS, WIS.—E. T. Olson and associates, Marquette, Mich., have organized Northwood Chemical Co. to acquire saw and planing mill plant of C. M. Christiansen here and add equipment for manufacturing chemical products through wood processing.

FOND DU LAC, WIS.—City will build new garbage incinerator costing $55,000 as WPA project already approved. Page A. Johnson is city engineer.

WHITEWATER, WIS.—Whitnall Conveyor & Mfg. Co. has been organized to take over business of Whitnall Sales & Service Co. to continue manufacture of portable conveyors and general material handling units. H. E. Whitnall is vice president and general manager.

Kansas

HOISINGTON, KANS. — Utilities Service Co. has been allotted $35,000 by REA to construct 35 miles rural transmission lines in Barton county.

NORTON, KANS. — State board of administration, J. A. Mermis, manager, plans to build a sewage disposal plant at state tuberculosis sanitorium. Paulette & Wilson, National Reserve building, Topeka, Kans., are engineers.

WINFIELD, KANS. — City will take bids April 26 for garbage incinerator for sewage disposal plant. Required capacity is 900,000 gallons a day and cost is estimated at $50,000. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo. are engineers.

Iowa

CLINTON, IOWA—Clinton, Davenport & Muscatine railroad is planning construction of 11 miles of transmission lines in Scott county, costing $15,000. B. J. Memna is president.

HOPKINTON, IOWA—City rejected all bids for construction of municipal light plant, estimated cost $66,000, and will readvertise for bids soon. A. W. McDonald is city clerk and A. S. Harrington, 503 Baum building, Omaha, Nebr., consulting engineer.

LOGAN, IOWA—Harrison county rural electric co-operative plans construction of additional 125 miles of rural transmission lines costing about $125,000 and will seek REA allotment. H. S. Nixon, Exchange building, Omaha, Nebr., is construction engineer.

MARCUS, IOWA—City has plans for construction of municipal power plant, to be financed through federal aid. Cost estimates are being drawn up.

PRESTON, IOWA—Jones county rural electric co-operative association plans construction of 98 additional miles of rural transmission lines at cost of $100,000. K. R. Brown, Des Moines, Iowa, is construction engineer.

WATERLOO, IOWA—City plans construction of electrically operated pumping station at sewage disposal plant. Cost is estimated at about $1,000,000. C. T. Wilson is city engineer.

Nebraska

DAVID CITY, NEBR. — Butler county rural public power district has plans approved by state engineer to construct 315 miles of rural transmission lines, estimated cost $316,565.

LINCOLN, NEBR. — City is planning water and light plant improvements, including new switchboard and auxiliary equipment to cost about $175,000. Theodore H. Berg is city clerk and D. L. Erickson, 4706 Broadway, Kansas City, Mo., is consulting engineer.

ST. EDWARD, NEBR. — Boone and Nonce counties rural public power district has state engineer's approval of plans to construct 518 miles rural transmission lines, estimated cost $562,705. H. H. Henningsen, Union State Bank building, Omaha, Nebr., is engineer.

STAMFORD, NEBR. — Beaver-Sappa public power and irrigation district has plans approved by state engineer for construction of dams, canals, storage reservoirs and transmission lines to cost $2,600,000. W. R. Martin, Hastings, Nebr., is construction engineer.

Pacific Coast

LOS ANGELES — Crellin Machine Co., 117-23 Llewellyn street, is building an addition 82 x 26 feet to cost $4000.

LOS ANGELES — American Manganese Steel Co. is erecting new foundry at 5805 Downey road, estimated cost $3500.

SAN DIEGO, CALIF. — National Iron Works will spend $30,000 to modernize plant and install new equipment. W. B. Dexter, company executive, is supervising program.

WILMINGTON, CALIF. — General Petroleum Corp. is building new casinghead gasoline absorption plant to cost between $250,000 and $300,000.

SEATTLE — Petroleum Engineering Corp. has been incorporated at $100,000 by M. E. Howard and associates, 318 McDowell building, Seattle.

SEATTLE—Blumauer-Frank Drug Co. will open bids soon for warehouse and office building, 120 x 140 feet, concrete, at Fifth avenue So. and Lander street. Plans, by Graham & Painter, Seattle, call for a conveyer and other equipment.

TACOMA, WASH.—City plans to build new city hall, concrete, seven stories, estimated to cost $1,627,250.

VALE, OREG.—Amalgamated Sugar Co. has purchased site for factory, warehouse and barracks at Nyssa. Total cost may be $2,000,000.

Canada

WELLAND, ONT. — Tope Construction Co., Hamilton, Ont., has been awarded contract for new foundry of McKinnon unit of the General Motors Corp. of Canada. Nearly $1,000,000 will be spent in construction and equipment. Work will start immediately on new 312-foot building.

Berger Mfg. Co. Equips New Building Products Plant

BERGER MFG. CO., Canton, O., subsidiary of Republic Steel Corp., recently completed installation of modern fabricating machinery in this building products plant, to be used exclusively for the manufacture of the company's Berloy Blue Label line of building products. Formerly occupied by the H. H. Miller Industries Co., this modern plant provides over 170,000 square feet of manufacturing floor space